



Operating instructions | for operators  
sonnenProtect 2500  
for sonnenBatterie hybrid 9.53

**IMPORTANT**

- ▶ Read this documentation carefully before installation / operation.
- ▶ Retain this document for reference purposes.

**Publisher**

sonnen GmbH

Am Riedbach 1

D-87499 Wildpoldsried

Service number

+49 8304 92933 444

Email

info@sonnen.de

**Document**

Document number

541

Part number

1000078

Version

X00

Valid for

UK

Publication date

25/09/2018

# Table of contents

<b>1</b>	<b>Information about this document</b> .....	4
1.1	Target group of this document .....	4
1.2	Designations in this document .....	4
1.3	Explanation of symbols.....	4
<b>2</b>	<b>Safety</b> .....	5
2.1	Intended use.....	5
2.2	Requirements for the electrician.....	5
2.3	Operating the product .....	5
2.4	Product modifications or changes to the product environment.....	6
2.5	Voltage inside the sonnenProtect.....	6
<b>3</b>	<b>Product description</b> .....	7
3.1	Technical data.....	7
3.2	System components of the sonnenProtect.....	8
3.3	Type plate.....	8
3.4	Symbols on the outside of the sonnenProtect.....	8
<b>4</b>	<b>Operation</b> .....	10
4.1	Function.....	10
4.1.1	Grid operation - no grid outage.....	10
4.1.2	Emergency operation - grid outage.....	11
4.1.3	Emergency operation - overload behaviour.....	12
4.2	Setting the backup buffer .....	13
<b>5</b>	<b>Switching off the sonnenProtect</b> .....	15
<b>6</b>	<b>Maintenance and Cleaning</b> .....	16
6.1	Checking function.....	16
6.2	Cleaning .....	16
<b>7</b>	<b>Uninstallation and disposal</b> .....	17
7.1	Uninstallation.....	17
7.2	Disposal.....	17
<b>8</b>	<b>Troubleshooting</b> .....	18

# 1 Information about this document

This document describes the operation of the sonnenProtect 2500 in connection with a sonnenBatterie hybrid 9.53 storage system.

- ▶ Read this document in its entirety.
- ▶ Keep this document in the vicinity of the sonnenBatterie.

## 1.1 Target group of this document

This document is intended for the operator of the storage system and the sonnenProtect.

## 1.2 Designations in this document

The following designations are used in this document:

Complete designation	Designation in this document
sonnenProtect 2500	sonnenProtect
sonnenBatterie hybrid 9.53	Storage system

## 1.3 Explanation of symbols



**DANGER** Extremely dangerous situation leading to certain death or serious injury if the safety information is not observed.



**WARNING** Dangerous situation leading to potential death or serious injury if the safety information is not observed.



**CAUTION** Dangerous situation leading to potential injury if the safety information is not observed.



**NOTICE** Indicates actions that may cause material damage.



**Important information not associated with any risks to people or property.**

Symbol	Meaning
▶	Work step
1. 2. 3. ...	Work steps in a defined order
✓	Condition
.	List

Table 1: Additional symbols

## 2 Safety

### 2.1 Intended use

The sonnenProtect 2500 is an emergency power unit designed to supplement the sonnenBatterie hybrid 9.53. The sonnenProtect- in conjunction with the appropriate storage system of the sonnen GmbH - serves to supply power in the event of a power failure. Any other use is considered improper use.

Improper use poses a risk of death or injury to the user or third parties as well as damage to the product and other items of value. The following points must therefore be observed in order to comply with the intended use of the product:

- Only operate the sonnenProtect together with the right storage system.
- The sonnenProtect must be installed by an authorised electrician.
- The sonnenProtect must only be connected to the storage system as described here.
- Generators (e. g. a PV system) must never be connected after the output of the sonnenProtect.
- Intended use includes observing this document as well as all accompanying product documentation of the appropriate storage system.
- The sonnenProtect must only be used at suitable installation location.
- The transport and storage conditions must be observed.

**Especially the following uses are not permissible:**

- Operation in flammable environments or areas at risk of explosion.
- Operation in locations at risk of flooding.
- Operation outdoors.



Failure to comply with the conditions of the warranty and the information specified in this document invalidates any warranty claims.

---

### 2.2 Requirements for the electrician

Improper installation can result in personal injury and/or damage to components. For this reason, the sonnenProtect must only be installed and commissioned by authorised electricians. Authorised electricians must meet the following criteria:

- The electrician must be a person with a technical knowledge or sufficient experience to enable him/her to avoid dangers which electricity may create.
- The company for which the electrician works must be certified by sonnen GmbH.
- The electrician must have successfully complete sonnen GmbH certification training for the product.

### 2.3 Operating the product

Incorrect operation can lead to injury to yourself or others and cause damage to property.

- The sonnenProtect must only be operated as described in the product documentation.
- This device can be used by children from the age of eight (8) years old and individuals with impaired physical, sensory or mental capabilities or individuals with limited knowledge and/or experience of working with the device, as long as they are supervised or

have been trained to safely use the device and understand the resulting risks of doing so. Children must not play with the device. Cleaning and user maintenance must not be carried out by children without supervision.

## 2.4 Product modifications or changes to the product environment

- The sonnenProtect must only be used in its original state without any user modifications and only when in perfect working order.
- Safety devices must never be overridden, blocked or tampered with.
- The interfaces of the sonnenProtect and the storage system must be wired in accordance with the product documentation.
- All repairs on the sonnenProtect must be performed by authorised service technicians only.

## 2.5 Voltage inside the sonnenProtect



The sonnenProtect contains live electrical parts, which poses a risk of electrical shock. The storage system inverter also contains capacitors which carry voltage even after the storage system is switched off. As the sonnenProtect is connected to the inverter of the storage system, this means that the voltage from the inverter also flows into the sonnenProtect. Therefore:

- ▶ Do not open the sonnenProtect.
- ▶ Do not remove any plastic covers.

## 3 Product description

### 3.1 Technical data

sonnenProtect 2500	
<b>System data</b>	
Nominal power	2,500 W
Maximum power (30 sec.)	3,000 W
Output voltage	230 VAC +/- 10 %
Nominal frequency	50 Hz
Network configuration in emergency operation	TN
Mains connection	single-phase, L / N / PE
Mains connections fuse	Miniature circuit breaker   Type B   20 A
Operating concept	Single-phase power supply via emergency circuit(s). The switch to emergency operation takes place automatically through the storage system.
Switchover time	max. 15 seconds
Threshold power	none (starting from 0 W)
<b>Dimension/Weight</b>	
Dimesion (H/W/D) in mm	230/200/122
Weight in kg	4.3
<b>Safety / Protective devices</b>	
Protection class	I / PE conductor
Degree of Protection	IP30
Overvoltage category	III
Protective functions	Overcurrent protection, fault current protection
Residal current device	integrated (Type A   30 mA)
<b>Ambient conditions</b>	
Environment	indoor (conditional)
Ambient temperature range	-5 °C ... 45 °C
Max. rel. humidity	90 %, non-condensing
Permissible installation altitude	2,000 m above sea level
Additional ambient conditions	The ambient conditions prescribed for the storage system apply.

Table 2: Technical data

### 3.2 System components of the sonnenProtect

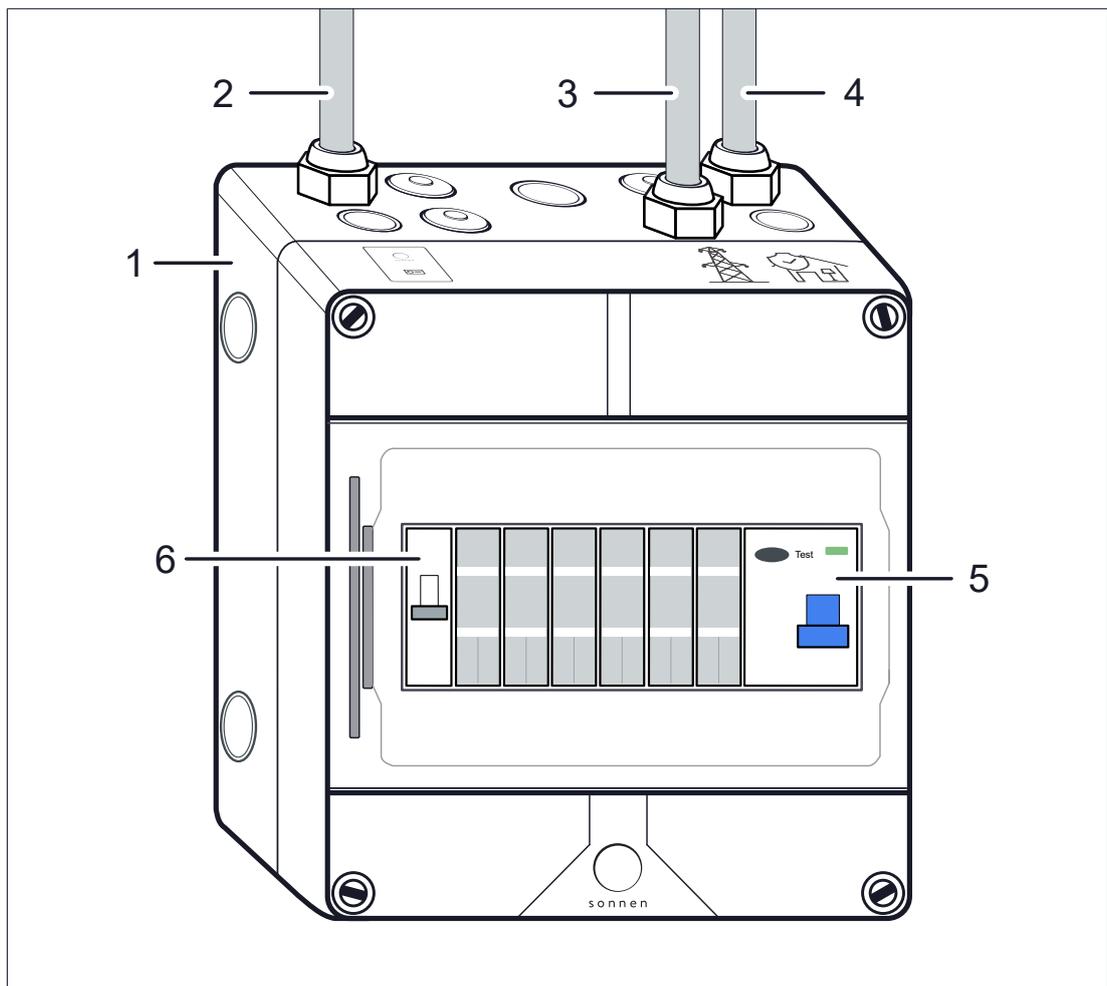


Illustration 1: System components of the sonnenProtect

1	sonnenProtect	4	Line to emergency circuit
2	Line from storage system	5	Residual current device (F4.P)
3	Line from electrical distributor	6	Miniature circuit breaker (F3.P)

### 3.3 Type plate

The type plate is located on the outer surface of the sonnenProtect. The type plate can be used to uniquely identify the sonnenProtect. The information on the type plate is required for the safe use of the system and for service matters.

The following information is specified on the type plate:

- Item designation
- Item number
- Technical data

### 3.4 Symbols on the outside of the sonnenProtect

Symbol	Meaning
	Warning: electrical voltage.

Symbol	Meaning
	<p>Warning: electrical voltage. Wait five minutes after switching off (capacitor de-energising time).</p>
	<p>CE mark. The product meets the requirements of the applicable EU Directives.</p>
	<p>WEEE mark. The product must not be disposed of in household waste, dispose of it through environmentally friendly collection centres.</p>
	<p>Observe the documentation. The documentation contains safety information.</p>

## 4 Operation

### 4.1 Function

A storage system with sonnenProtect automatically switches from grid to backup operation (and vice versa). The two operating modes are described in the following.

#### 4.1.1 Grid operation - no grid outage

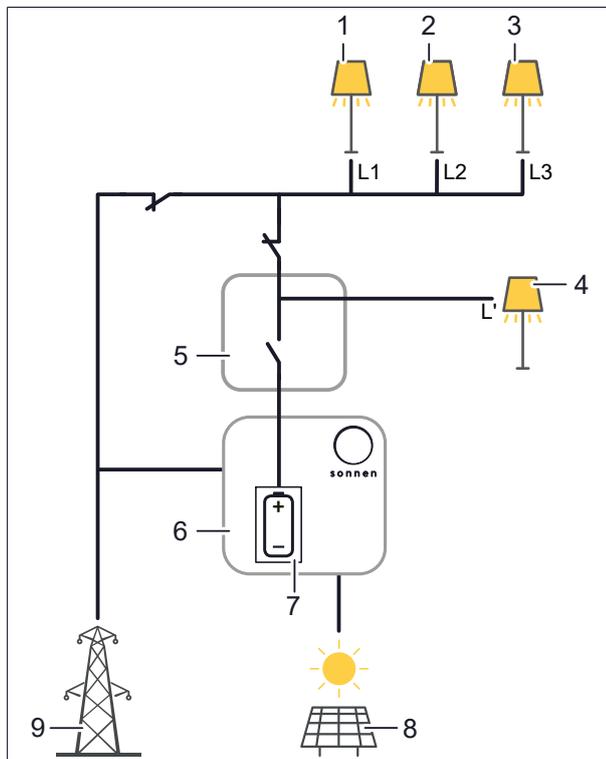


Illustration 2: Grid operation - no grid outage

- |   |   |   |                               |
|---|---|---|-------------------------------|
| 1 | Consumer connected to phase L1          | 6 | Storage system                |
| 2 | Consumer connected to phase L2          | 7 | Battery of the storage system |
| 3 | Consumer connected to phase L3          | 8 | PV system                     |
| 4 | Consumer connected to emergency circuit | 9 | Public electrical mains       |
| 5 | sonnenProtect                           |   |                               |

In grid operation the consumers connected to phase L1 to L3 and the consumers connected to the emergency circuit (1 - 4) are connected to the public electrical mains. All consumers in the house are supplied with electrical power. The storage system controls - as described in the product documentation of the storage system - the energy flows in the building.

### 4.1.2 Emergency operation - grid outage

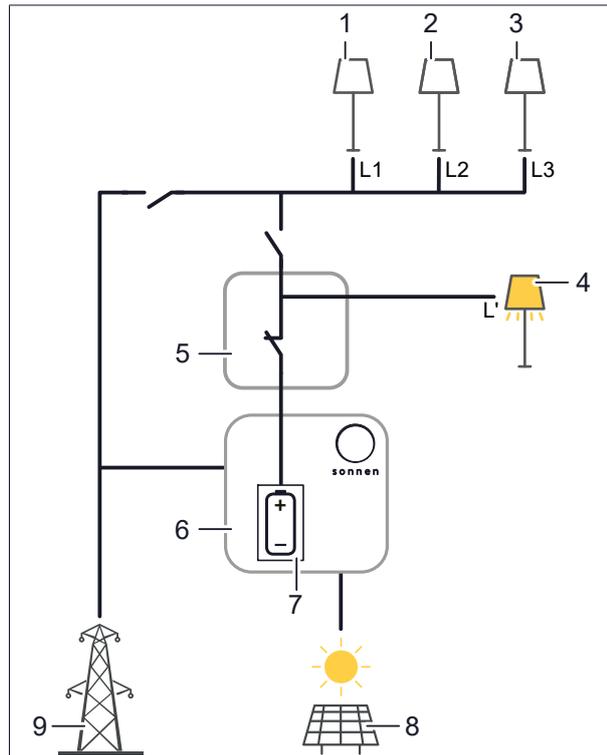


Illustration 3: Emergency operation - grid outage

- |   |   |   |                               |
|---|---|---|-------------------------------|
| 1 | Consumer connected to phase L1          | 6 | Storage system                |
| 2 | Consumer connected to phase L2          | 7 | Battery of the storage system |
| 3 | Consumer connected to phase L3          | 8 | PV system                     |
| 4 | Consumer connected to emergency circuit | 9 | Public electrical mains       |
| 5 | sonnenProtect                           |   |                               |

The sonnenProtect (5) automatically detects a grid outage. As soon as the voltage of the electrical mains drops to approx. 180 V, the connection to the public electrical mains (9) is disconnected.

Emergency power is generated after max. 15 seconds. The consumers connected to emergency circuit in the house (4) are thereby supplied with electrical power. Consumers connected to the phase L1, L2 or or L3 (1 - 3) will **not** be supplied with electrical power.

The switchover from grid to emergency operation is signaled by the **Eclipse** (light ring) on the storage system. The color of the Eclipse changes from **white** (normal operation) to **green** (offgrid operation).

Electrical power generated by the PV system (8) continues to be used by the storage system to supply the consumers in the emergency circuit and to charge the battery.

The storage system with sonnenProtect switches from emergency to grid operation as soon as the public electrical mains (9) start to deliver electrical power again.

#### Automatic stop and resumption of the emergency operation

The storage system with sonnenProtect generates electrical power until a minimum state of charge of the battery is reached. Thereafter, no further discharge is allowed.

If the discharge has stopped due to the minimum state of charge, the storage system remains in this state until the PV system starts to produce electrical power again. From then on, the batteries of the storage system are charged and as soon as the state of charge exceeds the minimum limit, the surplus power is used to supply the electrical consumers in the emergency circuit.

### 4.1.3 Emergency operation - overload behaviour

#### Case 1: Overload detection by fuse

The integrated fuse (miniature circuit breaker F3.P) of the sonnenProtect protects the entire system against overload.

When the fuse trips, the storage system will still be in emergency operation (Eclipse will turn **green**), but the electrical consumers in the emergency circuit will no longer be supplied with power!

- ▶ In this case, switch off the electrical loads or reduce their power consumption and then switch on the miniature circuit breaker F3.P in the sonnenProtect.

#### Case 2: Overload detection by storage system

In special overload cases, the control of the storage system reacts earlier than the integrated fuse of the sonnenProtect. In this case, the miniature circuit breaker inside the sonnenProtect does not trip, the emergency power is instead stopped by the control of the storage system. The eclipse of the storage system signals this by turning **orange**.

When this happens, there are two options:

1. The overload is removed: The storage system restarts the emergency operation after a few minutes and the eclipse changes from **orange** to **green**.
2. The overload remains: The storage system tries to resume emergency operation twice. If it is switched off a third time, the emergency operation remains disabled until the grid outage is over. The eclipse will continue to glow **orange**.

## 4.2 Setting the backup buffer

Proceed as follows to set what percentage of the capacity of the storage system should be available for the sonnenProtect in the event of a grid outage.

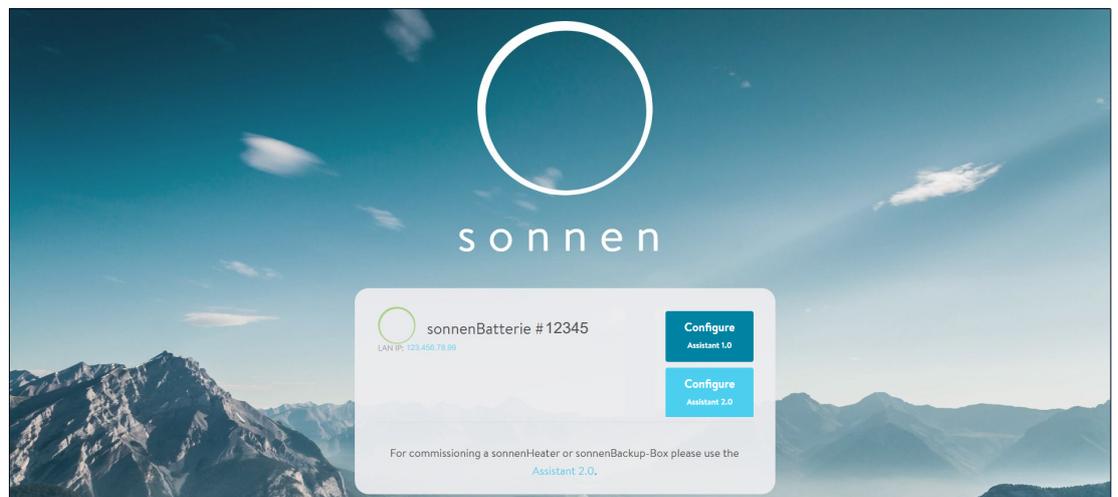
### Conditions:

- ✓ The storage system is connected to the router of the home network.
- ✓ Your laptop or PC also accesses the home network.
- ✓ The sonnenProtect was set up by the installer using the commissioning assistant 2.0.

Proceed as follows to access the storage system web interface:

- ▶ Enter the following address into your browser's address line:  
<https://find-my.sonnen-batterie.com>

The following window appears:

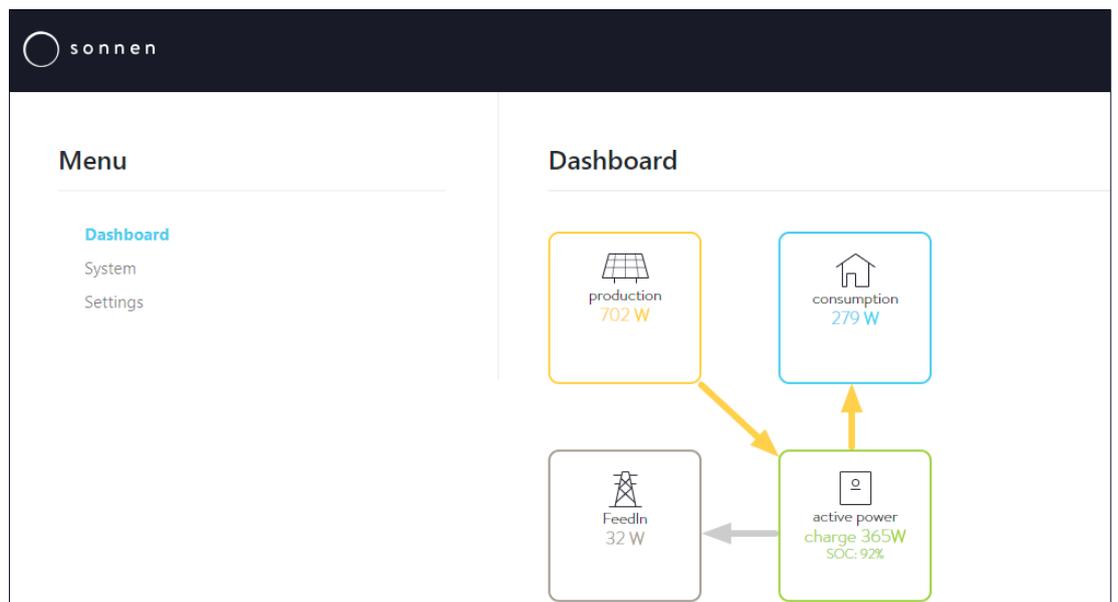


- ▶ Click the 'Configure Assistant 2.0' button.

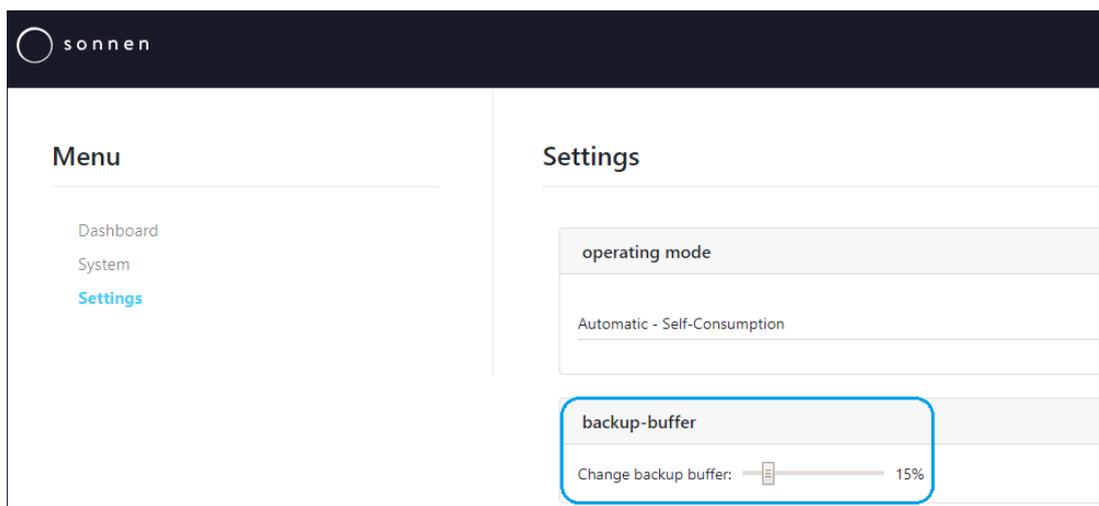
The login page appears.

- ▶ Log in as user with the following password: sonnenUser3552

The Dashboard appears.



- ▶ On the web interface of the storage system, navigate to the **Settings** page.
- ▶ Change the percentage for **backup-buffer** to a desired value.



The screenshot shows the Sonnen web interface. On the left is a 'Menu' with options: Dashboard, System, and Settings (highlighted in blue). On the right is the 'Settings' page. The 'operating mode' is set to 'Automatic - Self-Consumption'. The 'backup-buffer' is highlighted with a blue rounded rectangle and shows a slider set to 15%.

## 5 Switching off the sonnenProtect

To switch off the sonnenProtect manually, the following procedure can be carried out.

- ▶ Disconnect the power supply to the storage system as described in the relevant product documentation.

After switching off, the consumers connected to the emergency circuit(s) can no longer be supplied with electrical energy from the battery of the storage system.

### NOTICE

#### Deep-discharge of the battery modules

Destruction of the battery modules!

- ▶ Do not disconnect the storage system from the public grid for long periods of time.
- ▶ Never continue to operate battery modules which have been deep-discharged.

## 6 Maintenance and Cleaning

### 6.1 Checking function

A residual current device (RCD) is installed in the sonnenProtect. The function of the RCD can be tested by pressing the test key (T). After pressing, the RCD must switch off (the emergency circuit is interrupted).

Maintenance interval	Action to be taken
Every 6 months	▶ Check the function of the RCD with help of the Test key.

Table 3: Checking function

### 6.2 Cleaning

#### NOTICE

#### Use of unsuitable cleaning agent and/or excessive water

Material damage because of scratched surfaces and/or damage caused by penetration of water!

- ▶ Do not use scouring cloths, sponges or cleaning agent.
- ▶ Use only moist cloths, not wet cloths, to clean the system.
- ▶ Do not use water jets.

- ▶ Carefully clean the outside of the sonnenProtect with a clean, moist cloth. For tougher dirt, use a small amount of household dishwashing detergent on a moist cloth.

# 7 Uninstallation and disposal

## 7.1 Uninstallation

**⚠ DANGER**

**Improper uninstallation of the sonnenProtect**

Danger to life due to electrocution!

- ▶ The sonnenProtect must only be uninstalled by authorised electricians.

## 7.2 Disposal

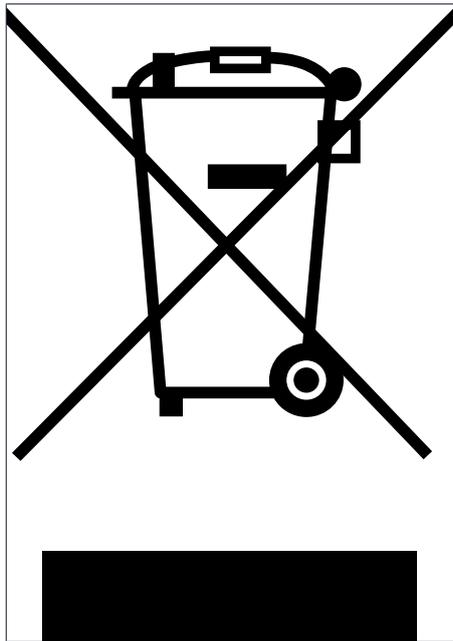


Illustration 4: WEEE symbol

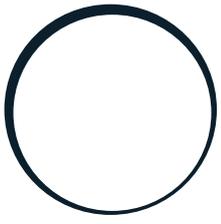
The sonnenProtect must not be disposed of as domestic waste!

- ▶ Dispose of the sonnenProtect in an environmentally friendly way through suitable collection systems.

## 8 Troubleshooting

Fault	Possible causes	Rectification
<b>Grid operation (no grid outage)</b>		
The electrical consumers in the emergency circuit are not supplied with energy in grid operation.	The lines of the emergency circuit have not been connected correctly.	Contact your installer to check the electrical wiring.
	The miniature circuit breaker in the supply line of the sonnenProtect is switched off.	Switch on the miniature circuit breaker in the supply line of the sonnenProtect.
	The miniature circuit breaker (F3.P) in the sonnenProtect is switched off.	Switch on the miniature circuit breaker (F3.P) inside the sonnenProtect.
	The RCD (F4.P) in the sonnenProtect is switched off.	Switch on the RCD (F4.P) inside the sonnenProtect.
<b>Emergency operation (grid outage) - Emergency operation does not start</b>		
Emergency operation doesn't start. The eclipse of the storage system is <b>off</b> .	The batteries of the storage system have discharged so much that further discharging would lead to a deep discharge state and therefore damage the batteries.	If the PV system generates electrical power, the emergency operation will continue as soon as excess power is available. If the PV system does not generate electrical power the only thing to do is wait until the grid outage passes and the public electrical grid once again starts supplying electrical energy. Then the sonnenProtect automatically switches to grid operation.
	The storage system is switched off.	Switch on the storage system.
Emergency operation doesn't start. The eclipse of the storage system is <b>green</b> .	The miniature circuit breaker (F3.P) in the sonnenProtect is switched off.	Switch on the miniature circuit breaker (F3.P) inside the sonnenProtect.
	The RCD (F4.P) in the sonnenProtect is switched off.	Switch on the RCD (F4.P) inside the sonnenProtect.
Emergency operation doesn't start. The eclipse of the storage system is <b>orange</b> .	Electrical consumers with too high power consumption are connected to the emergency circuit.	Switch off electrical consumers or reduce their power consumption.
		Only connect electrical consumers to the emergency circuit when they have a power consumption that does not exceed the nominal power or (when switching on) the maximum power of the sonnenProtect.

Fault	Possible causes	Rectification
<b>Emergency operation (grid outage) - Emergency operation stops</b>		
Emergency operation stops. The miniature circuit breaker and the RCD in the sonnenProtect have not switched off. The eclipse of the storage system is <b>off</b> .	The batteries of the storage system have discharged so much that further discharging would lead to a deep discharge state and therefore damage the batteries.	<p>If the PV system generates electrical power, the emergency operation will continue as soon as excess power is available.</p> <p>If the PV system does not generate electrical power the only thing to do is wait until the grid outage passes and the public electrical grid once again starts supplying electrical energy. Then the sonnenProtect automatically switches to grid operation.</p>
Emergency operation stops. The miniature circuit breaker (F3.P) in the sonnenProtect has switched off. The eclipse of the storage system is <b>green</b> .	The miniature circuit breaker detected an overload, this means electrical consumers with too high power consumption are connected to the emergency circuit.	<p>Switch off electrical consumers so that the power consumption does not exceed the nominal power or (when switching on) the maximum power of the sonnenProtect.</p> <p>Then switch on the miniature circuit breaker (F3.P) again. The storage system automatically restarts the emergency operation.</p>
Emergency operation stops. The RCD (F4.P) in the sonnenProtect has switched off. The eclipse of the storage system is <b>green</b> .	The RCD has detected fault currents in the emergency circuit.	Contact your installer to check the wiring and the connected electrical consumers and to correct the error.
Emergency operation stops. The miniature circuit breaker and the RCD in the sonnenProtect have not switched off. The eclipse of the storage system is <b>orange</b> .	The control of the storage system detected an overload, this means there are electrical consumers connected to the emergency circuit with a too high power consumption.	<p>Switch off electrical consumers so that the power consumption does not exceed the nominal power or (when switching on) the maximum power of the sonnenProtect.</p> <p>The storage system automatically restarts the emergency operation. The eclipse of the storage system is green.</p> <p>If the emergency operation does not start and the eclipse stays orange, the storage system has already unsuccessfully tried three times to start the emergency operation. Then the only thing to do is wait until the connection to the public electrical grid can be restored.</p>



sonnen

energy is yours