

Solarix MPPT 3020 / MPPT 5020

Installation and operating instructions



Preface

Thank you for choosing a solar charge controller from our company. Through the use of solar energy, you significantly help to protect the environment by reducing the pollution of the atmosphere by the emissions of carbon dioxide (CO₂) and other harmful gases.

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Table of contents

| | | |
|-----------|--|-----------|
| 1 | General information | 4 |
| 2 | Safety instructions | 5 |
| 2.1 | Labels and symbols | 6 |
| 2.1.1 | Safety marks | 6 |
| 2.1.2 | Keywords | 6 |
| 3 | Designated use | 7 |
| 4 | Overview | 8 |
| 5 | Installation | 9 |
| 6 | Operation | 13 |
| 6.1 | Switching on / switching off | 15 |
| 6.2 | Changing the display: | 16 |
| 6.3 | Settings menu | 18 |
| 7 | Maintenance and care | 26 |
| 8 | Disposal | 26 |
| 9 | Fault correction | 27 |
| 9.1 | Measures in the event of faults | 28 |
| 10 | Technical data | 30 |
| 11 | Commercial and legal guarantee conditions | 32 |
| 12 | Contact | 32 |

1 General information

The solar charge controller is available in two power levels (30 A and 50 A).

The device fulfils the following tasks:

- Optimizing the power yield of the connected solar modules
- Controlling the charging process of the battery
- Monitoring the charge state of the battery
- Connecting and disconnecting the consumers connected to the load output

Characteristics

- Intelligent Maximum Power Point Tracking
- Automatic battery voltage detection
- Three-stage charging process to optimize battery performance
- Maximum efficiency up to 99 %
- Charging current configurable depending on the application
- Support of various battery types
- Backlight
- Data output via serial interface (RS-232)

The state-of-the-art device is equipped with an optimized "Maximum Power Point Tracking (MPPT)" algorithm and is, thus, able to utilise the maximum available power of the solar module at any point in time and in a wide range of environmental conditions.

The type plate with the required data related to the device and the manufacturer is attached on the bottom of the right side.

The declaration of conformity is available on the website of the manufacturer.

Scope of delivery

- 1 x solar charge controller
- 1 x installation and operating instructions

Prior to the installation, check whether the packaging and the device are intact.

2 Safety instructions

This document is part of the product.

- Read these operating instructions thoroughly and completely prior to installation and use.
- Keep these operating instructions close the device over the entire lifetime of the device.
- Pass these operating instructions on to every subsequent owner or user of the product.

The installation may only be carried out by a qualified trained electrician.

The solar module and the battery supply voltage to the device even while the device is switched off. When connecting or disconnecting the solar module or the battery, proceed precisely as described in the instructions in chapter 5.

Incorrectly connected components can damage the device.

Improper operation can reduce the yields of the solar energy system.
System components can be damaged as well.

If one of the following components is damaged, immediately take the device out of operation and disconnect it from battery and solar module:

- Device (not functioning, visible damage, smoke, penetration of liquid etc.)
- Terminals and connected cables
- Solar module

Do not switch the device on again before it has not been repaired by the dealer or manufacturer, or the damaged cables or solar modules have not been repaired by a specialist.

Do not cover the device.

Follow the following instructions to prevent any risk of fire and explosion:

- Do not use the solar charge controller in a dusty environment, in the proximity of solvents, or where flammable gases and vapours may arise.
- Avoid open fire and light in proximity of the batteries. Avoid sparking.
- Ensure that the room is adequately ventilated.
- Check the charging process regularly.
- Follow the charging instructions of the battery manufacturer.

Do not open the case: There is danger to life! Opening the case will also void any warranty. Have the device only repaired by a qualified specialist workshop or the manufacturer.

Do not change, remove, nor render illegible the signs and markings attached by the manufacturer.

If connecting an external device that is not described within this document, follow the manufacturer's instructions. Incorrectly connected devices may cause damage to the solar charge controller.

Do not allow the following persons to operate the device:

- Children
- Persons with reduced physical, sensory or mental capabilities
- Persons that do not possess sufficient experience and knowledge (unless given instruction on proper use of the device and initial supervision by a person responsible for their safety)

Follow the safety instructions of the connected battery. The charging voltages and currents must be set on the solar charge controller in accordance with the battery documentation. The manufacturer disclaims all responsibility for damages due to solar charge controller parameters set incorrectly.




Follow the safety instructions of the connected solar module.

Follow the general and national safety and accident prevention regulations.

2.1 Labels and symbols

2.1.1 Safety marks

The following safety marks are used on the device and in these instructions:

| Warning sign | Nature of the danger |
|---|------------------------------|
|  | Warning of hazardous voltage |
|  | Warning of hazardous area |
|  | Follow the instructions |

2.1.2 Keywords

The following keywords are used in these instructions:

| Keyword | Meaning |
|----------------|---|
| DANGER | Indicates a hazardous situation which, if not avoided, leads to death or serious injuries. |
| WARNING | Indicates a potentially hazardous situation which, if not avoided, may lead to death or serious injuries. |
| NOTE | Indicates a potentially hazardous situation which, if not avoided, may lead to damage to property and/or the environment. |

3 Designated use

The solar charge controller is suitable for photovoltaic (PV) systems, for charging batteries of a rated voltage of 12 VDC or 24 VDC (50 A version also 48 VDC).

The areas of use include the fields of hobbies and leisure, businesses, commerce, and small companies.

Installation, putting into operation, and removal of the device may only be carried out by trained qualified personnel complying with the applicable on-site installation regulations. The qualified personnel must be acquainted with these operating instructions and follow the instructions.

The end customer may only carry out the operating functions.

The solar charge controller works with direct current and may not be connected to the public alternating current grid.

Operation is only allowed indoors.

The solar charge controller is only suitable for controlling solar modules. Do not connect any other charging sources to the solar charge controller. Otherwise, the solar charge controller and/or the source may be destroyed.

The connected solar modules and batteries must satisfy the stated specifications (refer to chapter 10).

The solar charge controller is basically suitable for the following types of rechargeable batteries:

- Lead accumulators with liquid electrolyte
- Sealed lead accumulators; AGM, GEL
- Lithium-ion batteries



NOTE

The operator must ensure that the solar charge controller's settings match the specifications on the battery's data sheet.

Only lithium-ion batteries may be applied that are equipped with an integrated BMS (Battery Management System) and a safety protective shut-down of the battery in the event of a fault provided that no communication with the BMS is required.

The respective battery type must be set on the solar charge controller, refer to chapter 6. The default setting is lead battery GEL/AGM.

Other battery types can be configured. An erroneous configuration may damage the solar charge controller or the battery. The use of the program function is at the operator's own responsibility.

Disclaimer

Both the compliance with these instructions and the conditions and methods during installation, operation, use, and maintenance of the solar charge controller cannot be supervised by the manufacturer. Improper performance of the installation may cause property damages and, subsequently, endanger persons.

Therefore, we assume no responsibility and liability for losses, damages or costs that result due to incorrect installation, improper operation, usage, and maintenance or in any manner associated therewith.

We also do not assume any responsibility for infringements of patent rights or infringements of other third-party rights resulting from the use of this solar charge controller.

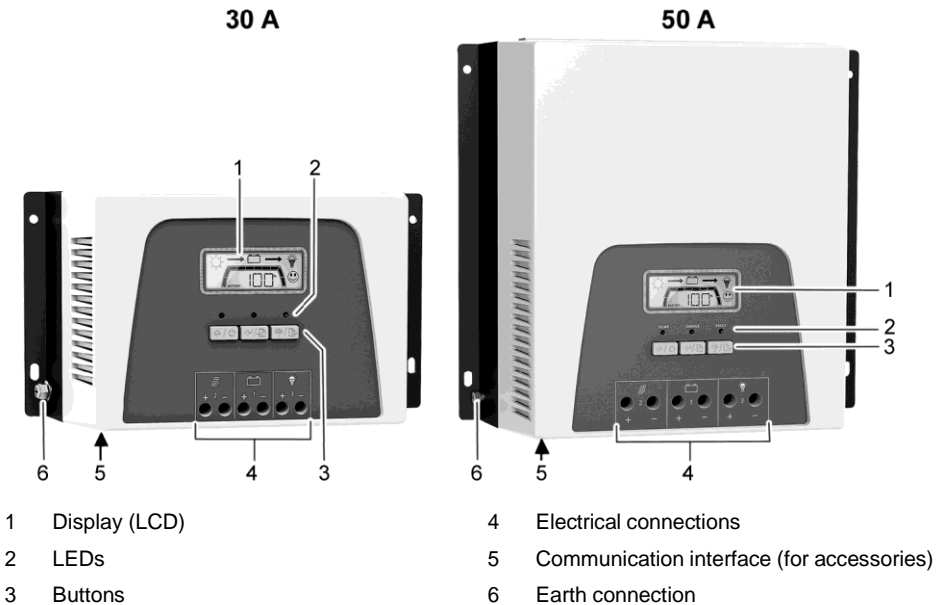
The manufacturer reserves the right to carry out modifications to the product, technical data, or installation and operating instructions without prior notice.

Attention: Opening the device, any manipulation and repair attempts, as well as any use not in accordance with the intended use result in the loss of warranty.

4 Overview

Two versions for different charging currents are available:

- Solar charge controller 30 A
- Solar charge controller 50 A



The solar charge controller optimizes the charging of the battery and its lifetime by means of a three-stage charging algorithm and a configurable equalizing charge:

| Charging stages | Description |
|-------------------|---|
| Bulk charge stage | The battery is charged with the maximum power possible depending on the input by the solar modules |
| Absorption stage | Battery charging at a constant voltage. The duration of the absorption charge is configurable. |
| Float stage | Trickle charging at a constant voltage. If the battery voltage drops below the threshold voltage for the float charge, a switch to bulk charge is performed. |
| Equalize stage | <p>The equalizing charge regenerates the battery to keep the capacity loss over the lifetime as low as possible.</p> <p>The equalizing charge function is controlled via the settings in the programs 07, 08, 09, 10, 11, 12, and 13. To use the function, it must have been activated in program 07.</p> |

5 Installation



DANGER

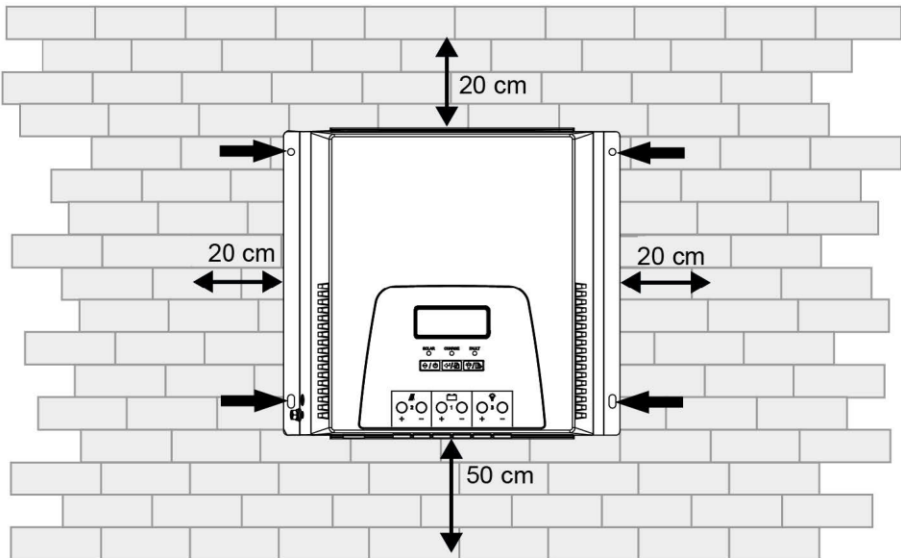
Voltage

Under solar radiation, the solar modules and cables may be energised. There is the risk of injuries and fire due electrocution and electric discharge.

- ▶ Disconnect the connections from the power sources prior to any work on the device.
- ▶ Only have specialists carry out any installation work.
- ▶ Only connect the cables to the solar charge controller when it is requested by the instructions.

Mounting location:

- Mount only indoors.
- Mount in vertical position on the wall, on concrete or another non-flammable surface. Mounting materials such as screws and dowels depend on the mounting surface and are, therefore, not included in the scope of delivery.
- Observe the free space specified below to ensure ventilation of the device.
- Observe the ambient temperature and air humidity specified in the technical data (refer to chapter 10).
- To allow a clear view of the display, mount the device at about eye level.
- Select mounting location such that the lengths of the cables to the solar module, the battery, and the consumer are kept as short as possible.

Mounting location with free space for ventilation

1. Place the device in mounting position.
2. Mark the position of the mounting bores through the four fixing holes on the device frame.
3. Drill the four mounting bores in the mounting surface (\varnothing 5 mm).
4. Fix the device with fixing materials suitable for the type of mounting surface.

Electrical connection

The connections to the solar modules must be realised with circuit breakers or disconnectors. The connections to the batteries must be realised with a fuse or a circuit breaker. It is not allowed to connect inverters to the load output.

Recommended core cross-sections, tightening torques, and battery circuit breakers:

| Device version | System voltage | Core cross-section | Tightening torque | Battery circuit breaker |
|----------------|----------------|---|-------------------|-------------------------|
| 30 A | 12 V | Battery: 16 mm ² Solar module: 16 mm ² Load: 16 mm ² | 1.2 Nm | 40 A |
| | 24 V | Battery: 6 mm ² Solar module: 6 mm ² Load: 6 mm ² | | |
| 50 A | 12 V | Battery: 16 mm ² Solar module: 25 mm ² Load: 16 mm ² | 2 Nm | 60 A |
| | 24 V | Battery: 6 mm ² Solar module: 6 mm ² Load: 6 mm ² | | |
| | 48 V | Battery: 6 mm ² Solar module: 6 mm ² Load: 2.5 mm ² | | |

The recommended core cross-sections apply to the following presumed distances to the device:

- 2 m to the battery
- 10 m to the solar module
- 5 m to the load

In the case of considerably different distances, the core cross-sections must be adapted.

The following solar module voltages are assumed:

- 30 V for 12 V system voltage
- 60 V for 24 V system voltage
- 90 V for 48 V system voltage

The tightening torques apply to the terminal screws of all electrical connections on the device. The values specified for the battery circuit breaker are calculated maximum values. This means that the battery circuit breaker used must trigger no later than when reaching this amperage.

It is recommended to use a two-pole circuit breaker between solar module and solar charge controller.

In this way, the solar modules can be connected to or disconnected from the solar charge controller without voltage, and no electric arcs will form at the terminals.

**NOTE**

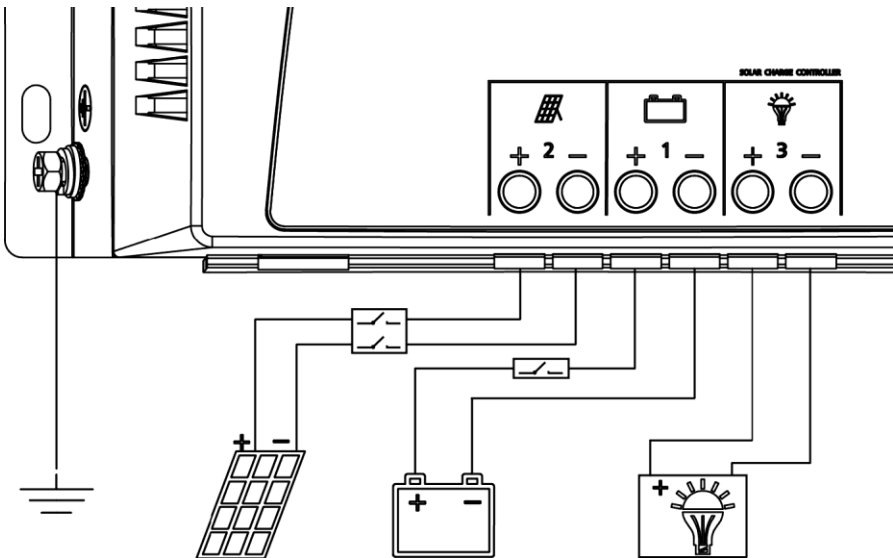
If the solar module is connected to the battery connections, the solar charge controller may be damaged.

Connect the cables correctly.

Ensure correct polarity by measurement of voltage on the cables prior to connection.

Observe the connection order described below to ensure correct operation of the solar charge controller.

Proceed in inverse order for uninstalling.



1. Ensure that all cables to the solar charge controller are without voltage due to the open isolating device (solar module circuit breaker or battery fuse).
2. Strip all cables on the connection side and provide with ferrules if necessary:
 - 30 A version: 10 mm
 - 50 A version: 18 mm

3. Successively introduce the conductors into the screw-type terminals of the solar charge controller and tighten the terminal screws.
4. Connect positive cable (+) of the battery to the battery positive input of the solar charge controller.
5. Connect negative cable (-) of the battery to the battery negative input of the solar charge controller.
6. Connect positive cable (+) of the solar module to the solar module positive input of the solar charge controller.
7. Connect negative cable (-) of the solar module to the solar module negative input of the solar charge controller.
8. Connect positive cable (+) of the consumer to the consumers circuit positive input of the solar charge controller.
9. Connect negative cable (-) of the consumer to the consumers circuit negative input of the solar charge controller.
10. Connect earth cable (at least AWG 8/10 mm²) to the earth connection of the solar charge controller.



NOTE

No more than one of the negative terminals or one of the positive terminals of the connections of the solar modules, of the battery, or of the load output may be connected to earth.

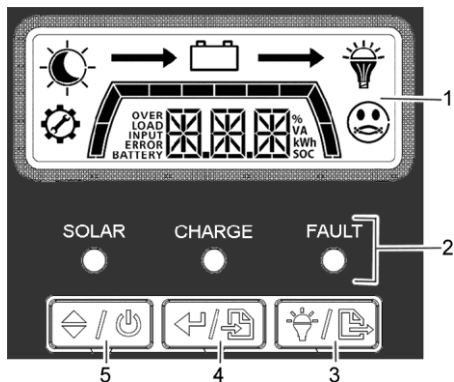
6 Operation



NOTE

A battery must have been connected prior to switching on. The solar charge controller does not work if a solar module but no battery is connected.

The operating panel consists of the display, three LEDs and three buttons:






- 1 Display
- 2 LEDs
- 3 "Load on/off & ESC" button
- 4 "Enter & Call settings menu" button
- 5 "Up/down & On/off" button




Meaning of the LEDs:







| LED | Colour | Status | Meaning |
|--------|--------|-----------------|---|
| SOLAR | Green | Permanently lit | Input Solar module normal |
| | | Off | Input Solar module without voltage or defective |
| CHARGE | Green | Permanently lit | Battery is fully charged |
| | | Flashing | Battery is being charged |
| FAULT | Red | Flashing | Error |
| | | Off | Solar charge controller is working normally |

Function of the buttons:

| Button | Function | Meaning |
|--|----------------------------|---|
|  | Up/down & On/off | Selecting next visualization Switching solar charge controller on and off if there is no input from the solar module present |
|  | Enter & Call settings menu | Confirming selection in the program mode Going to program mode or jumping to main page Acknowledging errors |
|  | Load on/off & ESC | Switching load circuit on and off manually leaving settings menu |

Symbols on the display:

| Symbol | Meaning |
|--|--|
|  | Display mode Program entry |
|  | Day/night indicator The moon symbol is shown while there is no input coming from the solar module |
|  | Indicates current flow |

| Symbol | Meaning |
|--|--|
|  | Battery |
|  | Consumer |
|  | Normal operation / fault |
|  | Level of battery charge When all segments are black, the battery is fully charged |
|  | Text display / values / unit |
| Display during program entry and fault | |
|  | Shows the program numbers |
| ERROR XX | Flashing with the code for warning Permanently lit with code for fault |

6.1 Switching on / switching off



NOTE

The solar charge controller starts automatically when a sufficiently high voltage from the solar module is present and a battery is connected.

The solar charge controller can also be switched on and off manually independently of the solar power.

1. Switch fuse to the battery on.
2. Press "Up/down & On/off" button. The main page appears on the display. The main page alternates between displaying the battery voltage and displaying the charge state of the battery.
3. Switch on the disconnecter to the solar module. If the sun is shining, the solar charge controller starts charging the battery.

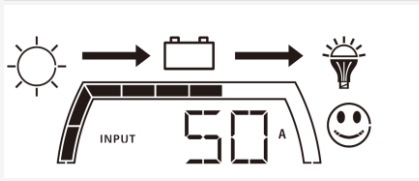
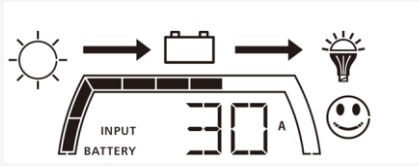
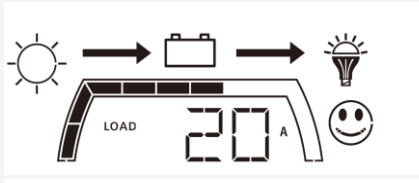
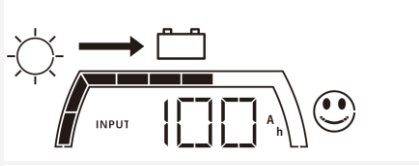
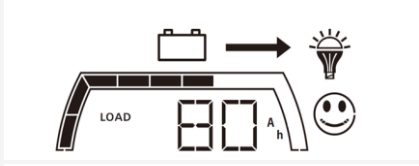
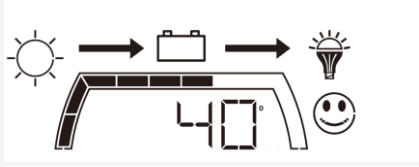
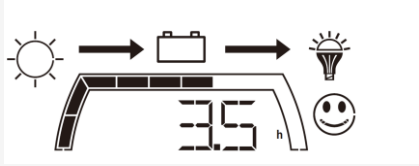

Examples for operating states:

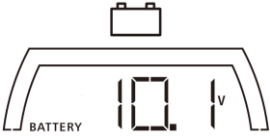
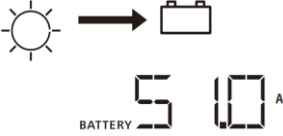


| Display | Meaning |
|---|---|
| <p>The diagram shows a solar panel icon on the left, an arrow pointing to a battery icon, and another arrow pointing to a light bulb icon. Below these is a battery level indicator with 10 segments, all filled. The digital display shows '12.5V'. To the right of the display is a smiley face icon.</p> | <p>Solar modules are working, battery is being charged Consumer is switched on</p> |
| <p>The diagram shows a solar panel icon on the left, an arrow pointing to a battery icon. Below these is a battery level indicator with 10 segments, all filled. The digital display shows '12.5V'. To the right of the display is a smiley face icon.</p> | <p>Solar modules are working, battery is being charged No consumer is switched on</p> |
| <p>The diagram shows a moon icon on the left, an arrow pointing to a battery icon, and another arrow pointing to a light bulb icon. Below these is a battery level indicator with 10 segments, all filled. The digital display shows '12.5V'. To the right of the display is a smiley face icon.</p> | <p>No input from the solar module The consumer is operated with battery current</p> |

6.2 Changing the display:

Press "Up/down & On/off" button repeatedly. The following information is displayed successively (the values in the figures are examples):

| Display | Meaning |
|---|---|
| <p>The diagram shows a solar panel icon on the left, an arrow pointing to a battery icon, and another arrow pointing to a light bulb icon. Below these is a battery level indicator with 10 segments, all filled. The digital display shows '12.5V'. To the right of the display is a smiley face icon.</p> | <p>Battery voltage (main page) (here: 12.5 V)</p> |
| <p>The diagram shows a solar panel icon on the left, an arrow pointing to a battery icon. Below these is a battery level indicator with 10 segments, 6 filled. The digital display shows '60%' with 'SOC' below it. To the right of the display is a smiley face icon.</p> | <p>Battery charge state (here: 60 %)</p> |
| <p>The diagram shows a solar panel icon on the left, an arrow pointing to a battery icon. Below these is a battery level indicator with 10 segments, all filled. The digital display shows '60V' with 'INPUT' below it. To the right of the display is a smiley face icon.</p> | <p>Solar module voltage (here: 60 V)</p> |




| Display | Meaning |
|--|--|
|  | Input current from the solar module(here: 50 A) |
|  | Charging current or discharging current (negative), battery (here: 30 A) |
|  | Load current, consumer(here: 20 A) |
|  | Total input power(here: 100 Wh) |
|  | Total output power(here: 80 Wh) |
|  | Device temperature (internal)(here: 40 °C) |
|  | Operating hours(here: 3.5 h) |
|  | Maximum occurred battery voltage(here: 14.7 V) |




| Display | Meaning |
|--|---|
|  <p>The diagram shows a battery icon at the top. Below it is a digital display with the number '10.1' and a 'V' symbol to its right. The word 'BATTERY' is written below the display.</p> | <p>Minimum occurred battery voltage (here: 10.1 V)</p> |
|  <p>The diagram shows a sun icon on the left, an arrow pointing to a battery icon in the middle, and a digital display below showing the number '51.0' and an 'A' symbol to its right. The word 'BATTERY' is written below the display.</p> | <p>Maximum occurred charging current (here: 51.0 A)</p> |
|  <p>The diagram shows a battery icon on the left, an arrow pointing to a light bulb icon on the right, and a digital display below showing the number '20.8' and an 'A' symbol to its right. The word 'LOAD' is written to the left of the display.</p> | <p>Minimum occurred discharging current (= load current) (here: 20.8 A)</p> |
|  <p>The diagram shows a digital display with the number '1.00'.</p> | <p>Firmware version (here: 1.00)</p> |





Then, the main page is displayed again.






6.3 Settings menu



1. Press "Enter & Call settings menu" button and hold for 3 seconds. The solar charge controller switches to the display mode Settings menu.
If no entry is made during approx. 20 seconds, the display returns to the main page.
2. Press "Up/down & On/off" button repeatedly to select a program. The currently selected menu item is flashing.
3. Press "Enter & Call settings menu" button to go to the selected program.
4. Press "Up/down & On/off" button to select the desired setting value (the displayed value is flashing).
5. Press "Enter & Call settings menu" button to confirm the desired value (the displayed value is no longer flashing).
Alternatively, press "Load on/off & ESC" button to **not** accept the value and return to the settings menu.
6. Press "Load on/off & ESC" button to return to the settings menu.





| Program selection | Name | Option | Meaning |
|---|---------------------------|--------|---|
|  01 | Setting battery voltage | AUT | The battery voltage is detected automatically |
| | | 12.0 | Setting battery voltage 12 V |
| | | 24.0 | Setting battery voltage 24 V |
| | | 48.0 | Setting battery voltage 48 V (only for 50 A version) |
|  02 | Selection of battery type | GEL | <p>Lead battery GEL/AGM (standard)</p> <p>The voltage values are automatically set for this battery type</p> <p>Programs 04 and 06 cannot be used when this setting is selected</p> |
| | | FLD | <p>Lead-acid battery (standard)</p> <p>The voltage values are automatically set for this battery type</p> <p>Programs 04 and 06 cannot be used when this setting is selected.</p> |
| | | LIO | <p>Lithium-ion battery</p> <p>When this setting is selected, programs 04 and 06 must be adapted</p> |
| | | USE | <p>User-defined values</p> <p>When this setting is selected, programs 04 and 06 must be adapted</p> |
|  03 | Maximum charging current | 50 A | Only for the 50 A version: Maximum charging current 50 A, can be set from 5 A to 50 A in increments of 5 A |
| | | 30 A | Only for the 30 A version: Maximum charging current 30 A, can be set from 5 A to 30 A in increments of 5 A |









| Program selection | Name | Option | Meaning |
|---|-----------------------------------|--------|---|
|  04 | Voltage of the absorption charge | | If "USE" has been selected in program 02, this program can be used |
| | | 14.4 V | 12 V rated voltage: Can be set from 12.0 V to 16.0 V (default setting: 14.4 V) |
| | | 28.8 V | 24 V rated voltage: Can be set from 24.0 V to 32.0 V (default setting: 28.8 V) |
| | | 57.6 V | 48 V rated voltage: Can be set from 48.0 V to 64.0 V (default setting: 57.6 V) |
| | | | If "LIO" has been selected in program 02, this program can be used |
| | | 28.8 V | 30 A version: Can be set from 9.0 V to 32.0 V |
| | | 57.6 V | 50 A version: Can be set from 9.0 V to 64.0 V |
|  05 | Duration of the absorption charge | 120 | Can be set from 10 min to 900 min in increments of 5 min (default setting: 120 min) |
|  06 | Voltage for float charge | | If "USE" has been selected in program 02, this program can be used |
| | | 14.1 V | 12 V rated voltage: Can be set from 12.0 V to 16.0 V (default setting: 14.1 V) |
| | | 28.2 V | 24 V rated voltage: Can be set from 24.0 V to 32.0 V (default setting: 28.2 V) |
| | | 56.4 V | 48 V rated voltage: Can be set from 48.0 V to 64.0 V (default setting: 56.4 V) |
| | | | If "LIO" has been selected in program 02, this program can be used |
| | | 28.2 V | 30 A version: Can be set from 9.0 V to 32.0 V |
| | | 56.4 V | 50 A version: Can be set from 9.0 V to 32.0 V |

| Program selection | Name | Option | Meaning |
|---|--|--|--|
|  07 | Equalizing charge function | EQE | Activating equalizing charge function |
| | | EQD | Deactivating equalizing charge function |
|  08 | Voltage for equalizing charge | If "USE" has been selected in program 02, this program can be used | |
| | | 15.0 V | 12 V rated voltage: Can be set from 12.0 V to 16.0 V (default setting: 14.1 V) |
| | | 30.0 V | 24 V rated voltage: Can be set from 24.0 V to 32.0 V (default setting: 28.2 V) |
| | | 60.0 V | 48 V rated voltage: Can be set from 48.0 V to 64.0 V (default setting: 56.4 V) |
| | | If "LIO" has been selected in program 02, this program can be used | |
| | | 30.0 V | 30 A version: Can be set from 9.0 V to 32.0 V |
| | | 60.0 V | 50 A version: Can be set from 9.0 V to 64.0 V |
|  09 | Charging current for equalizing charge | 50 A | Only for the 50 A version: Maximum charging current 50 A, can be set from 5 A to 50 A in increments of 5 A |
| | | 30 A | Only for the 30 A version: Maximum charging current 30 A, can be set from 5 A to 30 A in increments of 5 A |
|  10 | Duration of the equalizing charge | 240 | Can be set from 5 min to 900 min in increments of 5 min (default setting: 240 min) |

| Program selection | Name | Option | Meaning |
|---|--|--------|--|
|  11 | Maximum duration of the equalizing charge in case the voltage of the equalizing charge is not reached permanently Interval of the equalizing charge | 300 | Can be set from 5 min to 900 min in increments of 5 min (default setting: 300 min) |
|  12 | Starting/stopping equalizing charge | 30d | Can be set from 1 day to 90 days in increments of 1 day (default setting: 30 days) |
|  13 | Starting/stopping equalizing charge | EEN | Starting equalizing charge immediately |
| | | EDE | Stopping equalizing charge immediately |
|  14 | Undervoltage for disconnecting load current (under-voltage cutoff) | 11.5 v | 12 V rated voltage: Can be set from 9.0 V to 12.5 V in increments of 0.1 V (default setting: 11.5 V) |
| | | 23.0 | 24 V rated voltage: Can be set from 18.0 V to 25.0 V in increments of 0.2 V (default setting: 23.0 V) |
| | | 46.0 | 48 V rated voltage: Can be set from 36.0 V to 50.0 V in increments of 0.4 V (default setting: 46.0 V) |
|  15 | Voltage for switching load current on again after under-voltage cutoff | 12.5 V | 12 V rated voltage: Can be set from 9.0 V to 12.5 V in increments of 0.1 V (default setting: 12.5 V) |
| | | 25.0 | 24 V rated voltage: Can be set from 18.0 V to 25.0 V in increments of 0.2 V (default setting: 25.0 V) |
| | | 50.0 | 48 V rated voltage: Can be set from 36.0 V to 50.0 V in increments of 0.4 V (default setting: 50.0 V) |

| Program selection | Name | Option | Meaning |
|---|------------------------|--------|---|
|  16 | Control of load output | ON | On (default setting) Load output is always switched on, except in the event of under-voltage cutoff Switching off by pressing the "Load on/off & ESC" button for one second |
| | | OFF | Load output is always switched off Switching on by pressing the "Load on/ switching & ESC" button |
| | | LIG | Power-on time of the load output is controlled by the settings in program 18 |
| <p>The light function refers to the time of dusk and dawn, called sunset time and sunrise time. If the detected PV input voltage is lower than the set value in program 19, this is considered as dusk and the time is recorded as sunset time. If the detected PV input voltage is 5 V higher than the set value in program 19, this is considered as dawn and the time is recorded as sunrise time.</p> | | | |
|  17 | Mode for load control | EVEN | Evening light If selected, the load output is switched on after sunset and remains switched on for the duration set in program 18 |
| | | MOR | Morning light If selected, the load output is switched on before sunrise and remains switched on for the duration set in program 18 |
| | | NIT | Night light (standard) If selected, the load output is switched on for the entire night, from the sunset time to the sunrise time independently of the setting in program 18 |

| Program selection | Name | Option | Meaning |
|---|--|--------|--|
|  18 | Power on duration for load output | 480 | Can be set from 0 min to 480 min in increments of 5 min (default setting: 480 min) Can only be set if "LIG" is set in program 16 |
|  19 | PV voltage to define sunrise and sunset time | 15.0 | 12 V rated voltage: Can be set from 10 V to 80 V in increments of 1 V (default setting: 15.0 V) |
| | | 30.0 | 24 V rated voltage: Can be set from 20 V to 80 V in increments of 1 V (default setting: 30.0 V) |
| | | 60.0 | 48 V rated voltage: Can be set from 40 V to 80 V in increments of 0.1 V (default setting: 60.0 V) |
|  20 | Temperature compensation for battery voltage | 4 | Can be set from 0 mV to 10 mV in increments of 1 mV (default setting: 4 mV) |
|  21 | Performance compensation for battery voltage | 0 | Can be set from 0 mV to 30 mV in increments of 1 mV (default setting: 0 mV) The cables between solar charge controller and battery cause losses. This value compensates the losses by shifting the voltage. If, for example, 10 mV are specified, the charging end voltage is increased by 10 mV per ampere of charging current. At the same time, this value is deducted per ampere from the under-voltage cutoff (program 14) |

| Program selection | Name | Option | Meaning |
|---|--|--------|---|
|  22 | Display backlights | ON | Backlight is always switched on |
| | | OFF | Backlight is always switched off |
| | | AUT | Backlight is switched on when pressing a button The backlight will go out after 30 second of inactivity |
|  23 | Reset to factory setting | RST | - |
|  24 | Reset of total input power | RST | - |
|  25 | Reset of total output power | RST | - |
|  26 | Reset of saved maximum voltage of the battery | RST | - |
|  27 | Reset of saved minimum voltage of the battery | RST | - |
|  28 | Reset of saved maximum charging current of the battery | RST | - |
|  29 | Reset of saved maximum load current | RST | - |

7 Maintenance and care

The device is maintenance-free.

**DANGER**

Voltage.

There is a risk of death by electrocution.

Only clean device with a slightly moist cloth.

The care of the device is limited to the following measures:

- Removing dust
- Cleaning

Remove dust from the cooling fins of the device by using compressed air of a maximum of 2 bar.

Light soiling:

Clean surface of the case with a slightly moist cloth (use clear water).

Heavy soiling:

Clean surface of the case with a slightly moist cloth. In addition, use a cleaning agent without solvents or disinfectants, which does not contain any granular or sharp-edged substances.

Remove any residues of the cleaning agent.

8 Disposal



- ▶ Do not dispose of the device in the normal household waste.
- ▶ Dispose of the device in accordance with the local guidelines for disposal of electrical equipment.

9 Fault correction



DANGER

Voltage.

In the case of improper repairs, risks for the user and the system may arise. Any claim to warranty will also be cancelled.

- ▶ Do not open the device for troubleshooting and do not try to replace components by yourself.

If the device detects faults or impermissible operating states, error codes appear on the display. The "FAULT" LED is flashing.

You can generally differentiate whether there is a temporary malfunction, e.g. due to overload of the device, or if there is a sustained fault.

In the event of temporary malfunctions, the following symbols and error codes are flashing:

| Symbol and error code | Meaning |
|-----------------------|--------------------------------|
| ERROR 01 | Solar input power is too high |
| ERROR 03 | Charging current is too high |
| ERROR 05 | Device temperature is too high |
| ERROR 07 | Battery voltage is too low |
| ERROR 08 | Battery voltage is too high |
| ERROR 09 | Overload |

In the event of sustained faults, the following symbols and error codes are lit:

| Symbol and error code | Meaning |
|-----------------------|--|
| ERROR 02 | Internal memory error |
| ERROR 04 | Internal temperature sensor defective |
| ERROR 10 | Short circuit at the load output |
| ERROR 26 | System or battery voltage not detected |

9.1 Measures in the event of faults

| Displayed error code | Cause | Remedy |
|----------------------|------------------------------|---|
| 01 | PV overvoltage | <p>Check voltage of the solar modules</p> <p>The voltage must be lower than 100 V for the 30 A version, and smaller than 150 V for the 50 A version</p> <p>If the voltage of the solar modules is within the permitted range, contact the service</p> |
| 02 | Internal memory error | <p>Restart the device</p> <p>If the problem persists, contact the service</p> |
| 03 | Charging current too high | <p>Restart the device</p> <p>If the problem persists, contact the service</p> |
| 04 | Temperature sensor defective | <p>Restart the device</p> <p>If the problem persists, contact the service</p> |
| 05 | Excessive temperature | <p>Switch device off and restart after some time</p> <p>If the problem persists, contact the service</p> |
| 07 | Battery voltage too low | <p>Measure battery voltage and check setting in program 01:</p> <ul style="list-style-type: none"> - If a 12 V battery is connected, "AUT" or 12.0 V must be set in program 01 - If a 24 V battery is connected, "AUT" or 24.0 V must be set in program 01 <p>Compare the measured value for the battery voltage and the display on the device. In the event of discrepancy, contact the service</p> |
| 08 | Battery voltage too high | <p>Measure battery voltage and check setting in program 01:</p> <ul style="list-style-type: none"> - If a 24 V battery is connected, "AUT" or 24.0 V must be set in program 01 - If a 48 V battery is connected, "AUT" or 48.0 V must be set in program 01 (only applies to the 50 A version) <p>Compare the measured value for the battery voltage and the display on the device. In the event of discrepancy, contact the service</p> |

| Displayed error code | Cause | Remedy |
|----------------------|----------------------------------|--|
| 09 | Load output overloaded | <p>Check if the load output is overloaded</p> <p>Inverters must be connected directly to the battery, they must not be operated via the load output</p> <p>If the load output is overloaded, disconnect consumers from the load output</p> <p>If the problem persists, contact the service</p> |
| 10 | Short circuit at the load output | <p>Check if a short circuit is present at the load output</p> <p>Disconnect consumers from the load output</p> <p>Eliminate short circuit</p> <p>If the problem persists, contact the service</p> |
| 26 | System voltage not detected | <p>Check if the rated voltage of the battery matches the set value in program 01; adapt value in program 01 if necessary</p> <p>Restart the device.</p> <p>If the problem persists, contact the service</p> |
| - | No display | <p>Press "Up/down & On/off" button</p> <p>Check battery connection</p> <p>If the problem persists, contact the service</p> |

10 Technical data

| Version | 30 A | 50 A |
|--|--|---|
| Mechanics and surrounding | | |
| Dimensions (W x H x D) | 230 x 130 x 80 mm | 250 x 230 x 85 mm |
| Weight | 1.4 kg | 3.2 kg |
| Ambient temperature range | 0 °C to 55 °C | |
| Storage temperature | -40 °C to 75 °C | |
| Air humidity (relative) | 0 % to 90 % RH, non-condensing | |
| Degree of protection | IP 20 | |
| Electrical system | | |
| Rated voltage | 12 VDC or 24 VDC (automatic detection) | 12 VDC, 24 VDC, or 48 VDC (automatic detection) |
| Internal consumption | < 2 W | < 3 W |
| Max. charging efficiency | > 96 % | > 98 % |
| Input, solar modules | | |
| Max. voltage of the solar modules (under all temperature conditions at the installation site) | 100 V _{OC} | 150 V _{OC} |
| Max. output current, solar modules | 30 A (MPP) | 50 A (MPP) |
| Solar module MPPT voltage range | 12 V: 15 VDC to 80 VDC 24 V: 30 VDC to 80 VDC | 12 V: 15 VDC to 120 VDC 24 V: 30 VDC to 120 VDC 48 V: 60 VDC to 120 VDC |
| Max. useful charging power (recommendation: select maximally 20 % more than this power as solar power input) | 900 W | 3000 W |

| Version | 30 A | 50 A |
|--|--|--------------------------|
| Battery charging | | |
| Max. charging current | 30 A | 50 A |
| Required battery capacity | Min. 60 Ah | Min. 100 Ah |
| Charging stages | 3-stage, plus periodical equalizing charge: Bulk-Absorption-Float | |
| Charging voltage, absorption charge (rated value) | 14.4 V / 28.8 V | 14.4 V / 28.8 V / 57.6 V |
| Charging voltage, float charge (rated value) | 13.9 V / 27.8 V | 13.9 V / 27.8 V / 55.6 V |
| Load disconnect in the event of undervoltage (rated value) | 11.5 V / 23.0 V | 11.5 V / 23.0 V / 46.0 V |
| Switch-on after undervoltage | 12.5 V / 25.0 V | 12.5 V / 25.0 V / 50.0 V |
| Load disconnect in the event of overvoltage | 16.5 V / 33.0 V | 16.5 V / 33.0 V / 66.0 V |
| Switch-on after overvoltage | 16.0 V / 32.0 V | 16.0 V / 32.0 V / 64.0 V |
| Consumers circuit | | |
| Max. load current for consumers | 20 A | |
| Voltage at the load output | Corresponds to the battery voltage | |
| Consumers that require more than 20 A must be connected directly to the battery. Inverters must not be connected to the load output. | | |

11 Commercial and legal guarantee conditions

Find the warranty terms on internet at:

https://www.steca.com/index.php?5_Jahre_Garantie5ea97a3a7b893

12 Contact

In the case of complaints or faults, please contact the local dealer from whom you purchased the product. They will help you with any issues you may have.

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