Operating manual

Solar charge controller

10.10 A / 8.8 A / 6.6 A

Manufactured in a
DIN EN ISO 9001:2000 facility

Please read these instructions completely before installation!

1. About this manual

These operating instructions are part of the product. Read these operating instructions carefully before use, keep them over the entire lifetime of the product, and pass them on to any future owner or user of this product.
This manual describes the installation, function, operation and maintenance of the solar charge controller. These operating instructions are intended for end customers.
A technical expert must be consulted in cases of uncertainty.

2. Safety

The solar charge controller may only be used in PV systems for charging and controlling lead-acid batteries in accordance with this operating manual and the charging specifications of the battery manufacturer.
The solar charge controller may only be connected to the local loads and the battery by trained personnel and in accordance with the applicable regulations. Follow the installation and operating instructions for all components of the PV system.
No energy source other than a solar generator may be connected to the solar charge controller. Follow the general and national safety and accident prevention regulations.
Keep children away from PV systems. Do not use the solar charge controller in dusty environments, in the vicinity of solvents or where inflammable gases and vapours can occur. No open fires, flames or sparks in the vicinity of the batteries. Ensure that the room is adequately ventilated. Check the charging process regularly.
Follow the charging instructions of the battery manufacturer. Battery Acid splashes on skin or clothing should be immediately rinse with plenty of water. Seek medical advice.
Do not operate the solar charge controller when it does not appear to function at all. The solar charge controller or connected cables are visibly damaged or loose. In these cases immediately remove the solar charge controller from the solar modules and battery.

3. Functions

The solar charge controller monitors the state of charge of the battery bank, controls the charging process, controls the connection/disconnection of loads. This optimises battery use and significantly extends its service life.
The following protection functions are part of the basic function of the controller:
Overcharge protection ; Deep discharge protection ; Battery undervoltage protection ; Solar module reverse current protection.

4. Installation

4.1 Mounting location requirements

Do not mount the solar charge controller outdoors or in wet rooms. Do not subject the solar charge controller to direct sunshine or other sources of heat. Protect the solar charge controller from dirt and moisture.
Mount upright on the wall (concrete) on a non-flammable substrate. Maintain a minimum clearance of 10 cm below and around the device to ensure unhindered air circulation. Mount the solar charge controller as close as possible to the batteries (with a safety clearance of at least 30 cm).

4.2 Fastening the solar charge controller

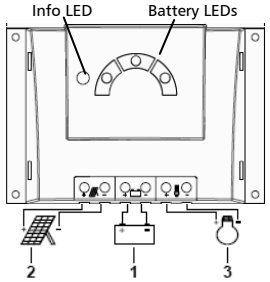
Mark the position of the solar charge controller fastening holes on the wall.
Drill 4 Ø 6 mm holes and insert dowels. Fasten the solar charge controller to the wall with the cable openings facing downwards, using 4 oval head screws M4x40 (DIN 7996).

4.3 Connection

Use an wire size suited to the current ratings of the charge controller, e.g. 6mm² for 10A, 5 mm² for 8A, 4 mm² for 6A, 3 mm² for 5A for cable length of 10 m.
An additional external 20A fuse (not provided) must be connected to the battery connection cable, close to the battery pole. The external fuse prevents cable short circuits.
Solar modules generate electricity under incident light. The full voltage is present, even when the incident light levels are low. Protect the solar modules from incident light during installation, e.g. cover them.
Never touch not isolated cable ends. Use only insulated tools. Ensure that all loads to be connected are switched off. If necessary, remove the fuse.
Connections must always be made in the sequence described below.

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1st step: Connect the battery

Connect the battery connection cable with the correct polarity to the middle pair of terminals on the solar charge controller (with the battery symbol).
If present, remove any external fuse. Connect battery connection cable A+ to the positive pole of the battery. Connect battery connection cable A– to the negative pole of the battery. Insert the external fuse in the battery connection cable.
If the connection polarity is correct, the info LED illuminates green.

2nd step: Connect the solar module

Ensure that the solar module is protected from incident light (cover it or wait for night).
Ensure that the solar module does not exceed the maximum permissible input current.
First connect the M+ solar module connection cable to the correct pole of the left pair of terminals on the solar charge controller (with the solar module symbol), then connect the M– cable. Remove the covering from the solar module.

3rd step: Connect loads

First connect the L+ load cable to the correct pole of the right pair of terminals on the solar charge controller (with the lamp symbol), then connect the L– cable. Insert the load fuse or switch on the load.
Notes : Connect loads that must not be deactivated by the solar charge controller deep discharge protection, e.g. emergency lights or radio connection, directly to the battery. Loads with a higher current consumption than the device output can be directly connected to the battery. However, the solar charge controller deep discharge protection will no longer intervene. Loads connected in this manner must also be separately fused.

4th step: Final work

Fasten all cables with strain relief in the direct vicinity of the solar charge controller (clearance of approx. 10 cm).

5. LED displays

LED	Status	Meaning
Info LED	illuminates green	normal operation
	flashes slowly red*	system fault - too high charging current - overload / short circuit - overheated together with red LED : - too low battery voltage together with green LED : - too high battery voltage
Battery red LED	flashing quickly*	battery empty, low voltage disconnection prewarning, loads still on
	flashing slowly*	deep discharge protection active (LVD), loads disconnected
Battery yellow LED	illuminates	battery weak, loads are on
	flashes slowly yellow*	LVD reconnection setpoint has not yet been reached, loads still disconnected
Battery green LED	illuminates	battery good
	flashes quickly green*	battery full, charge regulation active

*flashing slowly: 0,4Hz: 4 times in 10 second, flashing quickly: 3Hz: 3 times in 1 second

6. Grounding

The components in stand-alone systems do not have to be grounded – this is not standard practice or may be prohibited by national regulations (e.g.: DIN 57100 Part 410: Prohibition of grounding protective low voltage circuits). Ask your dealer for technical assistance.

7. Lightning protection

In systems subjected to an increased risk of overvoltage damage, we recommend installing additional lightning protection / overvoltage protection to reduce dropouts.
Ask your dealer for technical assistance.

8. Maintenance

The solar charge controller is maintenance-free.
All components of the PV system must be checked at least annually, according to the specifications of the respective manufacturers. Ensure adequate ventilation of the cooling element. Check the cable strain relief. Check that all cable connections are secure. Tighten screws if necessary. Check corrosion on terminals.

9. Faults and remedies

No display : Check battery polarity and external fuse. Or battery voltage is too low or battery defective.

Battery is not charged : Check if solar modul is connected with correct polarity or if short circuit at the solar input. If solar module voltage is lower than battery voltage or if solar module is defective the battery cannot be charged.

Battery displays jumps quickly : Battery voltage changes quickly. Large pulse currents cause voltage fluctuation. Battery is too small or defective. Ask your dealer for technical assistance.

The following faults do not destroy the controller if they occur singly. After correcting the fault, the device will continue to operate correctly:

* solar module short circuits
* short circuits at load output
* reversed battery polarity [*1]
* device overtemperature
* reverse solar module polarity [*2]
* excessive load current
* solar module overcurrent
* overvoltage at the load output

10. Legal guarantee

According to the German legal requirements, for this product the customer has a 2 year legal guarantee.
The seller will remove all manufacturing and material faults that occur in the product during the legal guarantee period and affect the correct functioning of the product. Natural wear and tear does not constitute a malfunction.
Legal guarantee does not apply if the fault can be attributed to third parties, unprofessional installation or commissioning, incorrect or negligent handling, improper transport, excessive loading, use of improper equipment, faulty construction work, unsuitable construction location or improper operation or use.
Legal guarantee claims shall only be accepted if notification of the fault is provided immediately after it is discovered. Legal guarantee claims are to be directed to the seller. The seller must be informed before legal guarantee claims are processed.
For processing a legal guarantee claim an exact fault description and the invoice / delivery note must be provided. The seller can choose to fulfil the legal guarantee either by repair or replacement.
If the product can neither be repaired nor replaced, or if this does not occur within a suitable period in spite of the specification of an extension period in writing by the customer, the reduction in value caused by the fault shall be replaced, or, if this is not sufficient taking the interests of the end customer into consideration, the contract is cancelled. Any further claims against the seller based on this legal guarantee obligation, in particular claims for damages due to lost profit, loss-of-use or indirect damages are excluded, unless liability is obligatory by German law.

11. Technical Data

Steca Solsum F	6.6F	8.8F	10.10F
Characterisation of the operating performance			
System voltage	12 V (24 V)		
Own consumption	< 4 mA		
DC input side			
Open circuit voltage solar module (at minimum operating temperature)	< 47 V		
Module current	6 A	8 A	10 A
DC output side			
Load current	6 A	8 A	10 A
End of charge voltage	13.9 V (27.8 V)		
Boost charge voltage	14.4 V (28.8 V)		
Reconnection voltage (SOC / LVR) [*3]	> 50 % / 12.4 V … 12.7 V (24.8 V … 25.4 V)		
Deep discharge protection (SOC / LVD) [*3]	< 30 % / 11.2 V … 11.6 V (22.4 V … 23.2 V)		
Operating conditions			
Ambient temperature	-25 °C … +50 °C		
Fitting and construction			
Terminal (fine / single wire)	4 mm^2 / 6 mm^2 - AWG 12 / 9		
Degree of protection	IP 32		
Dimensions (X x Y x Z)	145 x 100 x 24 mm		
Weight	approx. 150 g		

[*1] Solsum is protected against reverse battery polarity together with polarity protected loads. Reverse battery polarity combined with short circuited or polarised load could cause damages in load or regulator
[*2] The reverse-polarity protection of the solar module in a 24 V system is only provided up to an open-circuit module voltage of 36 V.
[*3] Lower value for nominal current, higher value for lowest current