



50Amp Solar Charge Controller



User's Manual

Dear Customer,

Thank you for buying a Sunforce 50 Amp Pro Series Charge controller. Please read the instructions carefully and thoroughly before using the product. Your new 50 Amp Pro Series Charge Controller is a state-of-the-art device which was developed according to the latest available technical standards. It comes with a number of outstanding features, such as:

- Multifunctional LCD display
- Complete electronic protection
- Negative Grounding

This manual gives important recommendations for installing, using and programming as well as remedies in case of problems with the controller. Read it carefully and mind the safety and usage recommendations at the end of this manual.

Major Functions

- The charge controller protects the battery from being overcharged by the solar array. The charging characteristics include several stages which includes automatic adoption to the ambient temperature.
- The charge controller adjusts itself automatically to 12V or 24V system voltage.
- The charge controller has a number of safety and display functions.

Recommendations for Use

- The regulator warms up during normal operation. If there is insufficient ventilation (e.g. in an installation cabinet), the controller limits the solar charge current to prevent overheating.
- The regulator does not need any maintenance or service. Remove dust with a dry tissue.
- It is important that the battery gets fully charged frequently (at least monthly). Otherwise the battery will be permanently damaged.
- A battery can only be fully charged if not too much energy is drawn during charging. Keep that in mind.

Mounting and Connecting the Charge Controller

The controller is intended for indoor use only. Protect it from direct

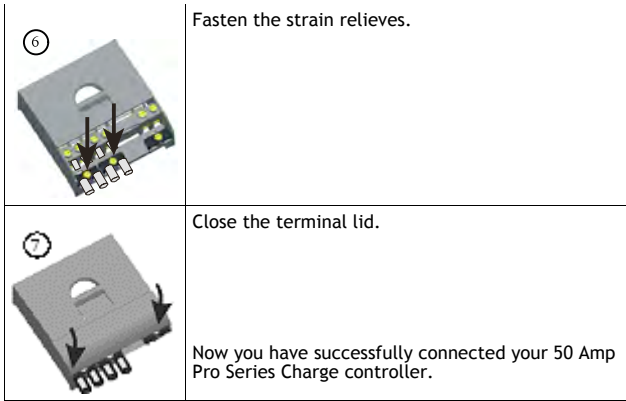
sunlight and place it in a dry environment. Never install it in humid rooms (like bathrooms).

The controller measures the ambient temperature to adopt the charging voltage; therefore it must be installed in the same room as the battery. The controller warms up during operation. It shall be installed on a non flammable surface only.

REMARK: Connect the controller by following the steps described below to avoid installation faults.

	<p>Open the terminal lid.</p>
	<p>Remove the screws from the strain relief and take off the strain relief bridges.</p>
	<p>Mount the controller to the wall with screws that fit to the wall material. Use screws with 4 to 5mm shaft and max. 9mm head diameter, no counter sunk. Mind that the screws have to carry also the force applied by the wiring. Mind also the minimum required distance to floor and ceiling, this is necessary for ventilation reasons. A mounting plate is available as an accessory (ITEM# 60124). This allows mounting the controller on a standard 35mm plate. Use the screws supplied with the mounting plate to fix it to the controller.</p>
	<p>Connect the wires leading to the battery with correct polarity. To avoid any voltage on the wires, first connect the controller, then the battery. Mind the recommended wire length (min 30 cm to max approx. 100 cm) and the wire size:</p> <ul style="list-style-type: none"> - min 2.5 mm² - 14 Gauge - min 4 mm² - 12 Gauge - min 10 mm² - 8 Gauge <p>Wrong polarity will cause a permanent warning sound.</p>
<p>REMARK: The controller has a built-in voltage drop compensation which automatically compensates battery wire voltage drops of up to 250mV.</p> <p>REMARK: Mind the recommendations of your battery manufacturer. We strongly recommend connecting a fuse directly to the battery to protect any short circuit at the battery wiring. The fuse must take the charge controller nominal current: 50 Amp Pro Series Charge controller: 50A</p>	

	<p>Connect the wires leading to the solar array with correct polarity. To avoid any voltage on the wires, first connect the controller, then the solar array. Mind the recommended wire size:</p> <ul style="list-style-type: none"> - min 2.5 mm² - 14 Gauge - min 4 mm² - 12 Gauge - min 10 mm² - 8 Gauge
<p>REMARK: place positive and negative wire close to each other to minimize electromagnetic effects.</p> <p>REMARK: Solar panels provide voltage as soon as exposed to sun light. Mind the solar panel manufacturer's recommendations in any case.</p>	

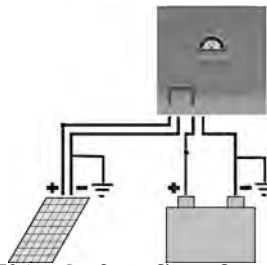


Fasten the strain reliefs.

Close the terminal lid.

Now you have successfully connected your 50 Amp Pro Series Charge controller.

Grounding the Solar System



Be aware that the 50 Amp Pro Series Charge Controller is negative grounding and the negative terminals of the 50 Amp Pro Series Charge Controller are connected internally and therefore have the same electrical potential. If any grounding is required, always do this on the negative wires.

Starting up the Controller

Self Test

As soon as the controller is supplied with power either from the battery or the solar array, it starts a self test routine. This is indicated first by running LCD bars for approx. 0.5s, and then the firmware version is displayed in coded symbols for about another second (this is for service purposes only). Then the display changes to normal operation.

System Voltage

The controller adjusts itself automatically to 12V or 24V system voltage. As soon as the voltage at the time of start-up exceeds 20.0V, the controller implies a 24V system. If the battery voltage is not within the normal operation range (approx. 12 to 15.5V or approx. 24 to 31V) at start-up, a status display according to the section ERROR DESCRIPTION occurs.

Battery Type

The controller is preset to operate with lead acid batteries with liquid electrolyte. If you intend to use a VRLA battery (GEL type) you can adjust the controller in Programming Menu 1 (see back page). The equalization charge is activated then. In case of any doubts consult your dealer.

Display Functions and Acoustic Signals

LCD Displays

In normal operation mode the controller displays the state of charge (available energy) of the battery. Any change of the state of charge (SOC) to a lower status is additionally signalled acoustically.

Disconnect in relation to a fully charged battery. As long as the solar array supplies enough voltage to charge the battery, this is indicated by up-moving bars alternately to the state of charge display.

Acoustics Signals

The controller has an acoustic signal which indicates the change of the state of charge. This function can be deactivated in Programming Menu 7.

Programming Lock-out

By pushing the programming button for 8s in normal operation mode the programming lock-out is activated to prevent any accidental settings change. Another 8s push releases the lock-out.

Optional Functions

External Temperature Sensor

With the optional temperature sensor the 50 Amp Pro Series Charge Controller can measure the battery temperature and adjust the charging voltage accordingly to extend the battery life span.

Programming your 50 Amp Pro Series Charge controller

You enter the programming mode with a long push (2s-8s) on the button. The programming menu structure is described as below.

Menu 1: Battery type

In this menu, you can select the proper battery type - liquid electrolyte or GEL (VRLA) according to your PV system to get better charge of your battery. The default battery type is GEL.

Menu 7: Buzzer on/off

You can turn ON/turn OFF the buzzer in this menu.

Menu 9: Individual / factory settings

You can save your current menu setting or reset to default factory setting in this menu.

When you exit programming menu, the controller displays the state of charge (available energy) of the battery.

■Mind that once you have entered the programming menu you can exit it at the last item only.

■We therefore recommend that you first note down your required settings in the check boxes beside the menu structure and then do the programming in one go. This makes programming easier and avoids errors.

■All programming settings are stored in a non-volatile memory and remain stored even if the controller was disconnected from the battery.

Error Description

Error condition	Display	Reason	Remedy
Battery is not being charged during daytime	No up-moving bars	Solar array faulty or wrong polarity	Check Solar array and wiring
Battery wrong polarity	Permanent sound	Battery is connected with reverse polarity	Remove reverse polarity
Controller limits solar current	Flashes	Solar array exceeds nominal current of controller	Check solar array current

Safety Features

The controller is protected against wrong installation or use:

	At the solar terminal	At the battery terminal
Battery connected with correct polarity	Unrestricted	Normal operation
Battery connected with wrong polarity	Unrestricted	Unrestricted. Acoustic Warning
Reverse polarity	Yes, not at 24V system voltage.	Yes, if only the battery is connected. Acoustic Warning
Short circuit	Unrestricted	Unrestricted. CAUTION: Battery must be protected by fuse.
Overcurrent	Controller limits current.
No connection	Unrestricted	Unrestricted
Reverse current	Unrestricted
Overvoltage	Varistor 56V, 2.3J	Max. 40V
Undervoltage	Normal operation

General Safety and Usage Recommendations

Intended Use

The charge regulator is intended for use in photovoltaic systems with 12V or 24V nominal voltage. It shall be used with vented or sealed (VRLA) lead acid batteries only.

Safety Recommendations

Batteries store a large amount of energy. Make certain to never short circuit a battery under any circumstances. We recommend connecting a fuse (slow acting type, according to the nominal regulator current) directly to the battery terminal.

■Batteries can produce flammable gases. Avoid making sparks, using fire or any naked flame. Make sure that the battery room is ventilated.

■Avoid touching or short circuiting wires or terminals. Be aware that the voltages on specific terminals or wires can be up to double the battery voltage. Use isolated tools, stand on dry ground and keep your hands dry.

■Keep children away from batteries and the charge regulator.

■Please observe the safety recommendations of the battery manufacturer. If in doubt, consult your dealer or installer.

Liability Exclusion

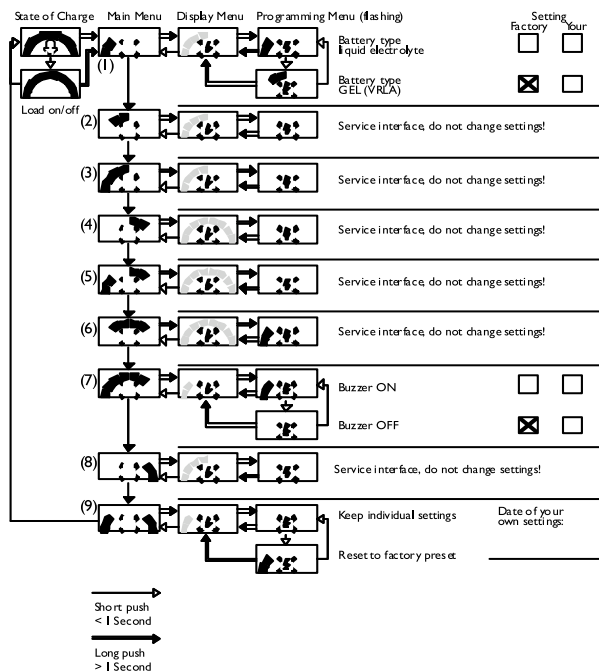
The manufacturer shall not be liable for damages, especially on the battery, caused by use other than as intended or as mentioned in this manual or if the recommendations of the battery manufacturer are neglected. The manufacturer shall not be liable if there has been service or repair carried out by any unauthorised person, unusual use, wrong installation, or bad system design.

Opening case voids warranty.

Technical Data

Nominal voltage	12 / 24V, automatic recognition
Absorption voltage	14.4 / 28.8V (25°C), 0.5-2h
Equalization voltage	14.8 / 29.6V (25°C), 2h
Float voltage	13.7 / 27.4V (25°C)
Temperature compensation	-4mV/cell*K
Max. solar panel current	50A according to model number @25°C
Dimensions	89 x 90 x 38mm (w x h x d)
Weight	186gr
Max. wire size	16mm ² (AWG #6)
Self consumption	6mA
Ambient temperature range	-25 to + 50°C
Case protection	IP22

Programming Menu



Subject to change without notice. ISO9001:2000
Version: Version: Sunforce 50 Amp Pro Series Charge controller.

Made in one of the following countries:
China - Germany



Limited Warranty

This product is covered by a 2 year limited warranty. Sunforce Products Inc warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of two (2) years from date of purchase. To obtain warranty service please contact Sunforce Products for further instruction, at 1-888-478-6435 or email info@sunforceproducts.com. Proof of purchase including date, and an explanation of complaint is required for warranty service.

For more information or technical support
1-888-478-6435

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