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SOLLATEK SPCC
SOLAR CHARGE CONTROLLERS
User instructions



SPCC10



SPCC10E

Important: This manual contains important safety instructions.
Keep this manual handy for reference.

INTRODUCTION

Charge controllers are one of the most essential parts of any solar electric system, monitoring and controlling the system and protecting the battery against overcharge by the solar modules and over discharge by the loads. A Sollatek SPCC will greatly increase battery lifetime and system reliability, whilst also giving the user a constant display of the system status.

Once installed, the SPCC operates automatically and requires no attention or maintenance from the user.

The SPCC is protected against short circuit, overload, reverse current flow, reverse polarity and lightning power surges.

For more information on our Solar products, contact us now.



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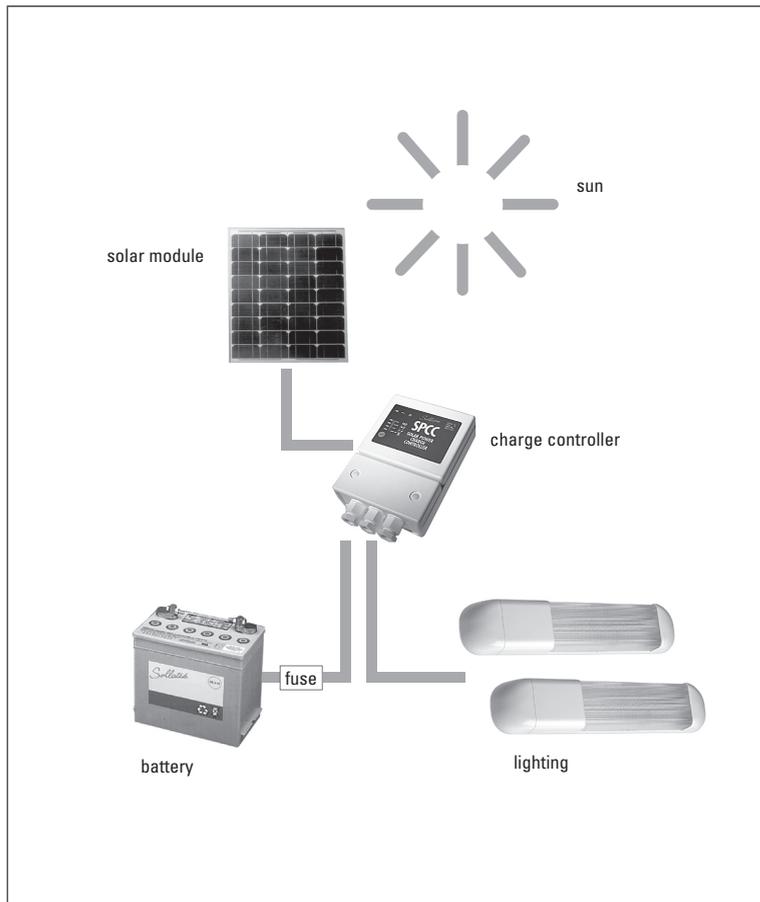
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The SPCC Charge Controller is covered by a two year worldwide warranty. If any problems should arise please return the SPCC to your local dealer or contact your nearest Sollatek company.

A TYPICAL SOLAR SYSTEM



SPECIFICATIONS

SPCC10 Specifications

Solar charge current		10 Amps
Load current		10 Amps
Nominal voltage		12 or 24 VDC
Current Consumption		35 mA
Voltage thresholds :	Charge disconnect	10-12 V
(double for 24V)	Charge reconnect hys.	1.2 V
	Charge disconnect	13-15 V
	Charge reconnect hys.	1.5 V
Battery low indications		@11.1V
Operating temperature		-10° to +50°C
Connections (max cable 4mm ²)		Screw type
Dimensions (mm)		182 x 132 x 53
Weight (Kg)		0.5

INSTALLATION SEQUENCE

Having made any adjustments necessary for operation of the SPCC10, follow the installation sequence below :-

1. Mount the SPCC10 on to a flat, vertical surface with the cable glands facing towards the floor. Insert one screw into the wall upon which to hang the controller, after which insert mounting screws into the two holes at the bottom section of the SPCC10. The controller should be as close to the battery as possible, in a well ventilated room and away from direct sunlight.
2. Connect the load cable to the controller through the left hand cable gland. The cable should have been stripped of 5mm of insulation and inserted into the terminals, observing the correct polarity. (Red/Brown is normally positive '+', Black/Blue is normally negative '-')
3. Connect the battery cable, observing the correct polarity. A fuse (15A) should be fitted in the battery cable at the positive terminal of the battery to prevent accidental short circuit damage of the controller and system.
4. Connect the cable from the solar module (s) ensuring that the solar module is covered. (During daylight sparks may occur at the controller terminals if the module is not covered)

Ensure that all connections and terminals are clean and tight

Always use the largest available cross section of cable in order to prevent voltage drops. If in doubt consult your dealer.

SYSTEM STATUS INDICATION



Battery is fully charged and the solar module has been disconnected.



Battery is in a good state of charge.



Battery is in a low state of charge and the load will soon be disconnected, depending on LVD setting.



The load output has been disconnected to avoid damaging the battery due to excessive discharge.



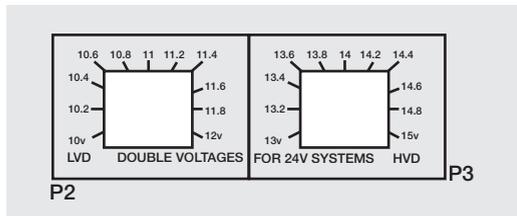
The reset button will reconnect the load after LVD has occurred and before LVD-Hyst in case of an emergency, or the LVD occurring at an inconvenient time.
The load will disconnect when LVD is reached again.

LVD	Low Voltage Disconnect
LVD-Hyst	Low Voltage Disconnect Hysteresis
Hysteresis	The voltage the battery must rise by before reconnecting again (1.2V).

ADVANCED TECHNICAL MODIFICATIONS



In order to adjust please follow the instructions noted below. Make sure that the SPCC10 is disconnected from the system before attempting any adjustments.



Voltage Thresholds

The voltage thresholds of low voltage disconnect (LVD) and high voltage disconnect (HVD) are user adjustable via rotary potentiometers situated in the top section of the controller circuit. The corresponding reconnect voltages are a fixed voltage from the disconnect voltages. For example, if LVD is set to 11.5V the reconnect voltage would be 12.7V. If LVD was set to 11.9V the reconnect would be 13.1V.

The adjustable controls allow the installer to set the voltage thresholds to their particular preference, depending on battery type and system requirements.

SPECIFICATIONS

SPCC10E Specifications

Solar charge current		10 Amps
Load current		10 Amps
Nominal voltage (field selectable)		12 or 24 VDC
Current Consumption :	Charging	8 mA
	Discharging	8 mA
	No load	8 mA
Voltage thresholds : (double for 24V)	Charge disconnect	11.3 V
	Charge reconnect hys.	12.3 V
	Charge disconnect	14.4 V
	Charge reconnect hys.	12.9 V
Battery temp. compensation		-3mV/°C/cell
Operating temperature		-10° to +50°C
Connections (max cable 6mm ²)		Screw type
Remote battery sense		Yes
Timer facility for light/street light		Yes
Dimensions (mm)		182 x 132 x 53
Weight (Kg)		0.5

INSTALLATION SEQUENCE

Having made any adjustments necessary for operation of the SPCC10E, follow the installation sequence below :-

1. Mount the SPCC10E on to a flat, vertical surface with the cable glands facing towards the floor. Insert one screw into the wall upon which to hang the controller, after which insert mounting screws into the two holes at the bottom section of the SPCC10E. The controller should be as close to the battery as possible, in a well ventilated room and away from direct sunlight.
2. Connect the load cable to the controller through the left hand cable gland. The cable should have been stripped of 10mm of insulation and inserted into the terminals, observing the correct polarity. (Red/Brown is normally positive '+', Black/Blue is normally negative '-')
3. If required, install the external battery sense cable between the battery terminals and the 'Batt sense' terminals in the SPCC10E. The external temperature compensation probe cable should be connected to the terminals of the SPCC10E and the actual probe stuck onto the side of the nearest battery within the system.
4. Connect the battery cable, observing the correct polarity. A fuse (15A) should be fitted in the battery cable at the positive terminal of the battery to prevent accidental short circuit damage of the controller and system.
5. Connect the cable from the solar module (s) ensuring that the solar module is covered. (During daylight sparks may occur at the controller terminals if the module is not covered)

Ensure that all connections and terminals are clean and tight

Always use the largest available cross section of cable in order to prevent voltage drops. If in doubt consult your dealer.

SYSTEM STATUS INDICATION



Solar panel is generating electricity and charging the battery except when green 'battery full' LED is illuminated.



Battery is fully charged and the solar module has been disconnected.



Battery is in a good state of charge.



Battery is in a low state of charge and the load will soon be disconnected, depending on LVD setting.



The load output has been disconnected to avoid damaging the battery due to excessive discharge.



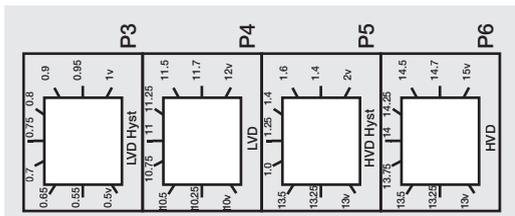
The reset button will reconnect the load after LVD has occurred and before LVD-Hyst in case of an emergency, or the LVD occurring at an inconvenient time. The load will disconnect when LVD is reached again. The reset button will also reinitialise the system.

LVD	Low Voltage Disconnect
LVD-Hyst	Low Voltage Disconnect Hysteresis
Hysteresis	The voltage the battery must rise by before reconnecting again.

ADVANCED TECHNICAL MODIFICATIONS



The SPCC10E is factory set for immediate use at 12V using internal battery sense and temperature compensation and at the voltage thresholds indicated overleaf. In order to adjust please follow the instructions noted below. Make sure that the SPCC10E is disconnected from the system before attempting any adjustments.



Voltage Thresholds

The voltage thresholds can be re-set using the four rotary controls located in the upper half of the controller.

The adjustable controls allow the installer to set the voltage thresholds to their particular preference, depending upon battery type and system requirements.

The miniature thumbwheels are removable to prevent un-authorized tampering of the rotary controls. When replacing them, ensure they are fitted in the correct orientation.

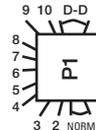
The low and high reconnect voltages are a hysteresis of the low and high disconnect voltages. If the required low volt disconnect is 11.5 volts and the required reconnect 12.3 volts then the LVD-Hyst rotary control should be set to 0.8 v ($11.5 + 0.8 = 12.3$). Similarly if the HVD is 14V and the required reconnect is 12.9V, the HVD-Hyst control should be set to 1.1V ($14 - 1.1 = 12.9$)

12 or 24V Operation

The SPCC10E is supplied ready for 12V operation, the installer can easily set the controller for 24V operation by adjusting jumpers as shown below. All the voltage threshold values will double for 24V (11V becomes 22V - 0.6V becomes 1.2V etc.)

Timer Operation - Street Light Mode/SPCC10E Mode

The SPCC10E is supplied with a timer set at normal mode. To put the SPCC10E in street light mode, the dial has to be set to the required number of hours of lighting, or fully clockwise to give dusk to dawn lighting. During the day when the load is off, the red LED and the battery state LED will be on constantly. At dusk, the battery state LED will flash and the load will come on. The Load will be on until Low voltage disconnect, dawn or the timer has elapsed whichever comes first. There is a dawn detection delay which will only enable the unit to accept dawn if the solar module voltage is above 3 volts for 4 minutes. This prevents the load switching off unexpectedly during the night as a result of headlights on motor vehicles and search lights on helicopters shining on the solar module.



External Battery Sense

Although the SPCC10E is fitted with internal battery voltage sensing, for greater accuracy an external sense cable can be installed between the battery terminals and the "Batt sense" terminals within the controller as shown overleaf. It is important to make sure that the battery sense cable polarities are correct and J1 is set to 2+3 position.

A 1Amp fuse should be fitted in the positive sense wire at the battery end.

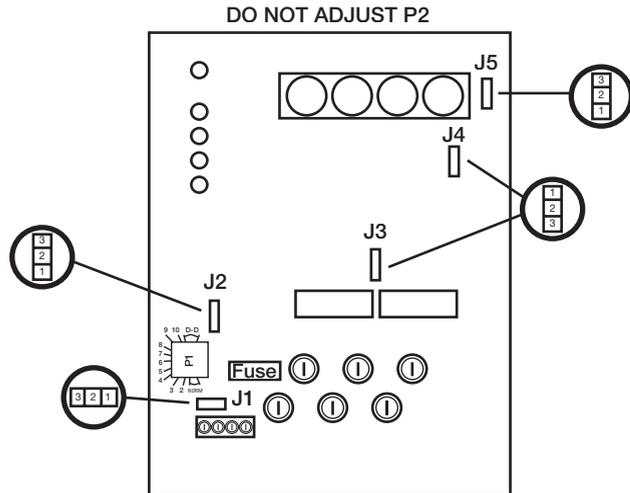
External Temperature Compensation

The SPCC10E can be fitted with an external temperature compensation probe. This probe is available as an option from Sollatek and should be wired into the temperature compensation terminals of the SPCC10E as shown overleaf (observing polarity).

The probe should then be stuck to the nearest battery on the system.

Jumper Positions

Function	J.1	J. 2	J.3	J.4	J.5
External					
Battery Sense	2+3				
Internal					
Battery Sense	1+2	1+2			
External Temp.Comp.				No Jumpers to Set	
12 V Operation		2 + 3	2 + 3	2 + 3	2 + 3
24 V Operation		1 + 2	1 + 2	1 + 2	1 + 2



TROUBLESHOOTING

Symptom	Cause	Solution
Sun LED is not illuminated during daylight	Solar modules not properly connected	Check module connections and ensure that polarities are correct
Battery status LEDs do not illuminate	Battery incorrectly installed or fuse blown	Check cables and fuses for short circuits and correct polarity connections
	Battery acid is very low (wet batteries only)	Fill the battery cells with distilled water
	Battery is dead	Replace
Internal load fuse blows (15Amp)	Short circuit in the load	Find and repair short circuit, check cables
	Load is drawing too much current	Reduce load size
Rapid on/off operation of relays (chattering)	Voltage thresholds have been set incorrectly	Adjust thresholds to limits indicated in these instructions
	Battery is significantly undersized	Increase number or capacity of battery
Loads do not operate	Blown load fuse	Establish cause of blown fuse and replace
	Lights: dead tube/lamp	Replace tube/lamp
	Cable diameter too small (high voltage drop)	Increase cable size to reduce voltage loss
Incorrect system operation	Jumpers set incorrectly	Set jumpers as per table overleaf
	System needs re setting	Press reset button
Battery full and battery low LEDs flashing alternately	Solar module reverse connected	Correct polarity
	Temp sensor faulty or reverse connected	Replace faulty temp sensor