

Applies only to SunWare solar panels with three wire cable!

State 2012

!Attention!

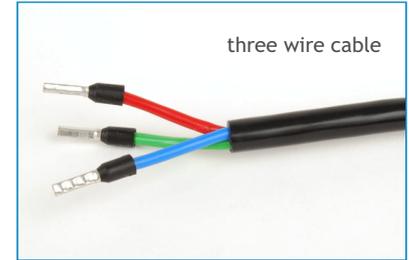
Before using your solar module, you have to connect the enclosed cell-protector!

- The cable of each single SunWare solar module with a three wire cable has to be connected to a separate cell-protector.

Polarities:

- red = solar module "+"
- blue = solar module "-"
- green = middle contact

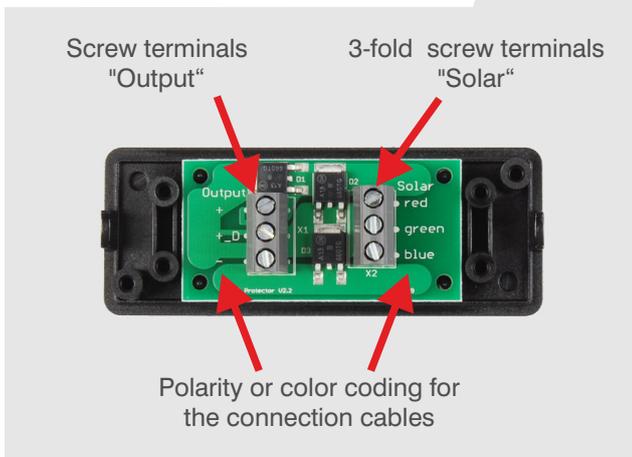
- The serial or parallel connection of SunWare solar modules has to be done **BEHIND** the cell-protector.
- The cell-protector has to be mounted/operated in a dry place, it must not become wet or moist with dew.



Connection cell-protector

- Screw the 3 wires of the modules cable in the terminal block "Solar". Please note the colour marking! The wire ends have to be screwed down and correct in the screw terminals.
- Use for connection to the charge controller a standard 2x1,5mm² cable at terminal block "Output". Two connection types are possible, see below. Please pay attention to the polarity +/- .
- Fix the cable to the base plate of the box by the 2 attached strain relief clamps.
- Screw the cap of the box onto the base plate - ready.

Cell-protector with PCB board



Type of connection A and B

A) Bypass diodes (standard method)

Left: two cables to charge controller, terminals "+", "-"



With this hookup, the cells are protected with 2 bypass diodes against the hot spot effect.
www.sunware.de/sunware/technik/hotspot

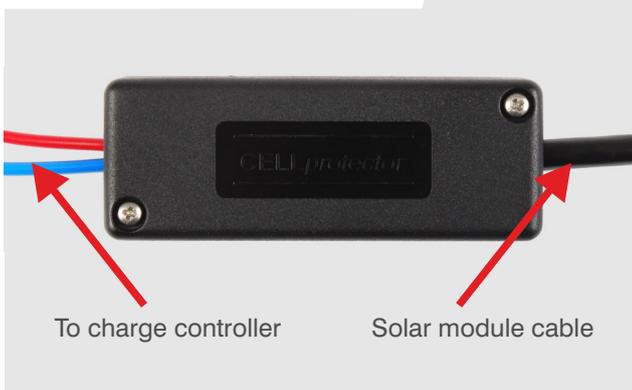
B) Bypass diodes + Reverse current protection

Left: two cables to charge controller, terminals "+_D", "-"



With this hookup, the cells are protected with 2 bypass diodes against the hot spot effect and the additional blocking diode protects against reverse current back into the module. By damage to a module or cable by several modules in parallel operation an influence can be prevented on the other modules with the use of the blocking diode.

Cell-protector assembled





Where to find the cell-protector:

All SunWare solar modules with three-core cable are supplied with a cell-protector.

These modules are labeled with a sticker on the packaging / note for the cell-protector.

The cell-protector is located in a recess of the inner cardboard.

See arrow, photo on the left. View: cardboard from the bottom.

Content cell-protector:

2x housing parts, 1x PCB-Board, 2x relief clamps, 4x screws, 2x screws for housing cover

Function of cell-protector:

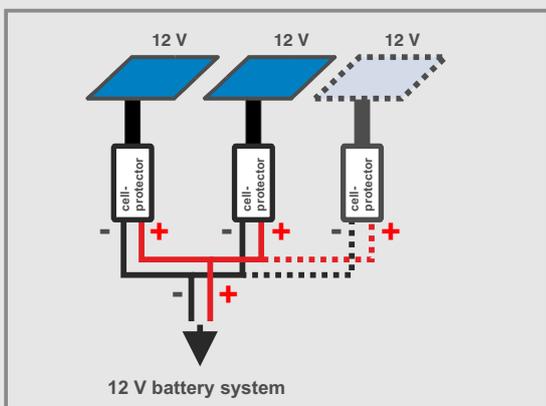
The purpose of the cell-protector is to prevent overheating of the solar cells when the solar module is partial shaded (Hotspot). This is achieved by the diodes on the circuit board. By standard aluminium framed glass modules these diodes are located in the junction box on the backside of the modules.

Bypass diodes can be damaged by power surges and lightning. By fitting into the cap a replacement would be impossible. Therefore the bypass diodes at SunWare marine solar modules are installed in the external cell-protector. Additionally a diode is incorporated on the PCB-board to prevent reverse current. Depending on the type of connection, this protection can be used. However, the Schottky-diode produces a voltage drop of about 0,6V.

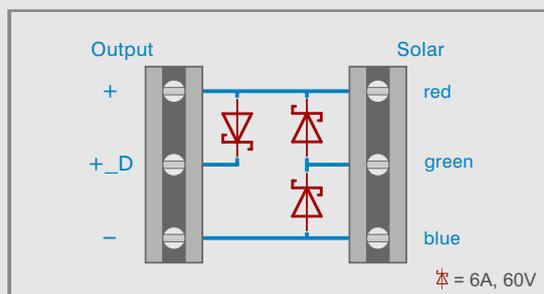
Connection graphics

Cell-protector required only for modules with 3-wire connection cable!

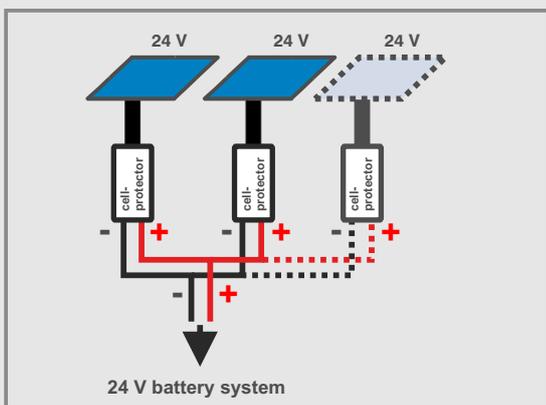
12V: Parallel connection of 12V solar modules



Circuit diagram cell-protector V2.2



24V: Parallel connection of 24V solar modules



24V: Serial connection of 24V solar modules

