

↗ DOMETIC

ENERGY & LIGHTING

SUN POWER



PSB150

EN

Portable Solar Blanket Kit
Installation and Operating Manual

Please read this instruction manual carefully before installation and first use, and store it in a safe place. If you pass on the product to another person, hand over this instruction manual along with it.

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1 Explanation of symbols



WARNING!
Safety instruction: Failure to observe this instruction can cause fatal or serious injury.



CAUTION!
Safety instruction: Failure to observe this instruction can lead to injury.



NOTICE!
Failure to observe this instruction can cause material damage and impair the function of the product.

2 General safety instructions

The manufacturer accepts no liability for damage in the following cases:

- Damage to the product resulting from mechanical influences and incorrect connection voltage
- Alterations to the product without express permission from the manufacturer
- Use for purposes other than those described in the operating manual

The declaration of conformity can be requested from the manufacturer (contact information on the back).

Note the following basic safety information when using electrical devices to protect against:

- Electric shock
- Fire hazards
- Injury

2.1 General safety



WARNING!

- Only use the device as intended. Any alternation to the product without express permission from Dometic Australia head office avoids warranty.
- Disconnect the device
 - Before cleaning and maintenance
 - After use
 - Before changing a fuse
- The device may not be used if the device itself or connection cables are visibly damaged.
- This device may only be repaired by qualified personnel. Inadequate repairs may cause serious hazards.
- This device can **not** be used by children as well as by persons with diminished physical, sensory or mental capacities or a lack of experience and knowledge.
- **Electrical devices are not toys.**
Always keep and use the device out of the reach of children.
- Children must be supervised to ensure that they do not play with the appliance.

**NOTICE!**

- Check the manufacturer's data for your battery and ensure that the maximum voltage of the solar charge controller does not exceed the manufacturer's recommended charging voltage.
- Do not use the device to charge non-rechargeable batteries.
- Be sure to connect the battery before exposing the solar blanket to the sun.
- Store the device in a dry and cool place.

2.2 Safety when installing the device

**WARNING!**

- The electrical installation may only be connected by qualified personnel and only in accordance with the national regulations. Incorrect connection may cause severe hazards.
- Take the precautions necessary to ensure that children cannot interfere with operation. Dangerous situations may occur which cannot be recognised by children.

**NOTICE!**

- Do not expose the device to a heat source (open fire, heating etc.). Avoid additional heating of the device in this way.

Electrical cables

**CAUTION!**

- Lay the cables so that they cannot be tripped over or damaged.

**NOTICE!**

- If cables have to be fed through metal walls or other walls with sharp edges, use ducts or bushings to prevent damage.
- Do not lay cables which are loose or bent next to electrically conductive material (metal).
- Do not pull on the cables.
- Do not lay AC cables and DC cables in the same duct.
- Fasten the cables securely.

2.3 Operating the device safely



CAUTION!

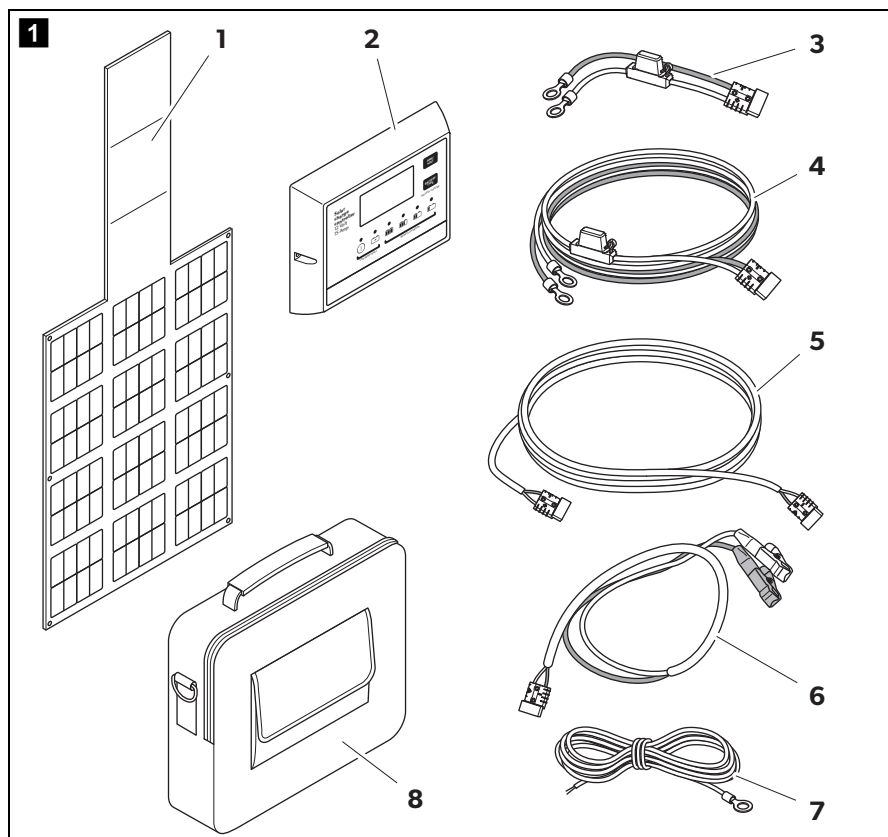
- Do **not** use the solar blanket in windy or gusty conditions until it is safely secured through 6 eyelets.
- Do **not** operate the device
 - In salty, wet or damp environments
 - In the vicinity of corrosive fumes
 - In the vicinity of combustible materials
 - In areas where there is a danger of explosions



NOTICE!

- Do not disconnect any cables when the device is still in use.
- Do not seat, drop, walk or place heavy items on the solar blanket.
- Do not place heavy items on top of the solar blanket when in storage.

3 Scope of delivery



No. in fig. 1	Description
1	Portable solar blanket with junction box
2	15 A PWM solar charge controller
3	Cable with grey Anderson connector to ring terminals with fuse 15 A
4	Cable with black Anderson connector to ring terminals with fuse 15 A
5	5 m extension cable with grey Anderson sockets
6	Cable with grey Anderson connector to Alligator clips
7	Temperature sensor
8	Carry bag

4 Intended use

The portable solar blanket is a mobile power supply with a solar charge controller for charging a 12 V $\equiv$ battery.

5 Technical description

The portable solar blanket consists of lightweight solar cells with anti-reflective, scratch-resistant ETFE coating. The solar charge controller stored in a bag of the blanket can be used to charge a 12 V $\equiv$ battery.

The solar charge controller ensures that the power supplied by the solar blanket is at the right voltage to charge a home or auxiliary battery. The solar charge controller is an intelligent 5 stage PWM solar controller.

Solar charge controller

The solar charge controller has the following functions:

- PWM controlled
- Five stage charging (Soft, Bulk, Absorption, Equalization, Float)
- Battery types selectable: LiFePO₄, LTO, GEL, AGM, WET or CALCIUM
- LCD display dynamically displaying operating data and working condition

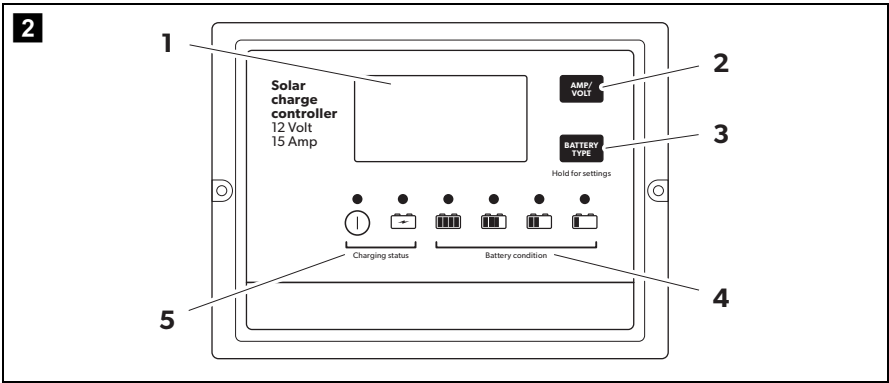
Additional protective functions of the solar charge controller:

- Incorrect polarity protections for battery
- Over voltage protection for battery
- Over heating protection for battery
- Battery over-discharge protection
- Under charge protection for battery
- Over charge protection for battery
- Short circuit protection
- Prevents discharge at night under low light or no light condition

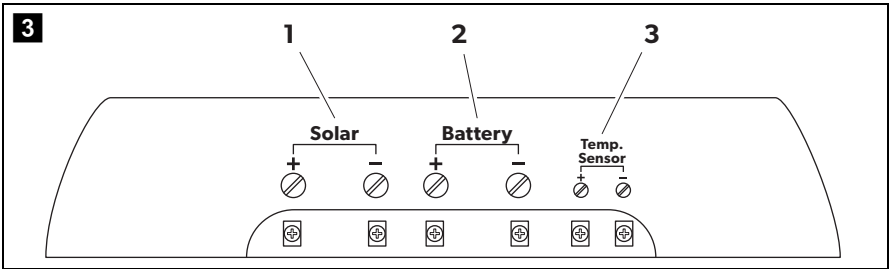
Battery temperature sensor

The battery temperature sensor allows the solar charge controller to continuously adjust charge voltage based on measured battery temperature. Temperature compensation of charge voltage assures that the battery receives the proper charge voltage as battery temperature changes during normal operation.

5.1 Connecting and operational elements

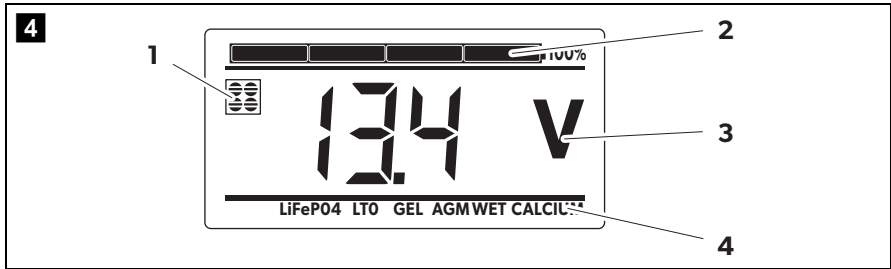


No. in fig. 2	Description	
1	Display	See chapter “Display elements” on page 9
2	AMP/VOLT button	Select the parameter to be displayed
3	BATTERY TYPE button	Select the battery type
4	BATTERY CONDITION LEDs	Monitoring the battery condition according to the LEDs lighting.
5	CHARGING STATUS LEDs	Monitoring the charging status of the battery according to the LEDs lighting.



No. in fig. 3	Description	
1	Solar blanket terminals	
2	Battery terminals	
3	Temperature sensor	

5.2 Display elements



No. in fig. 4	Description
1	Indicates that the solar blanket is connected.
2	Indicates the charging status of the battery.
3	Indicates the parameters. By pressing the VOLT/AMP button in sequence, the display indicates the following parameters in turn: At day: Battery Voltage (V) – Charging Current (A) – Charged capacity (Ah) – Battery Temperature (°C, if temperature sensor connected) At full battery: Battery Voltage (V) – FULL At night: Battery Voltage (V) – Battery Temperature (°C, if temperature sensor connected)
4	Indicates the battery type: LiFePO4, LTO, GEL, AGM, WET or CALCIUM battery

6 Using the solar blanket

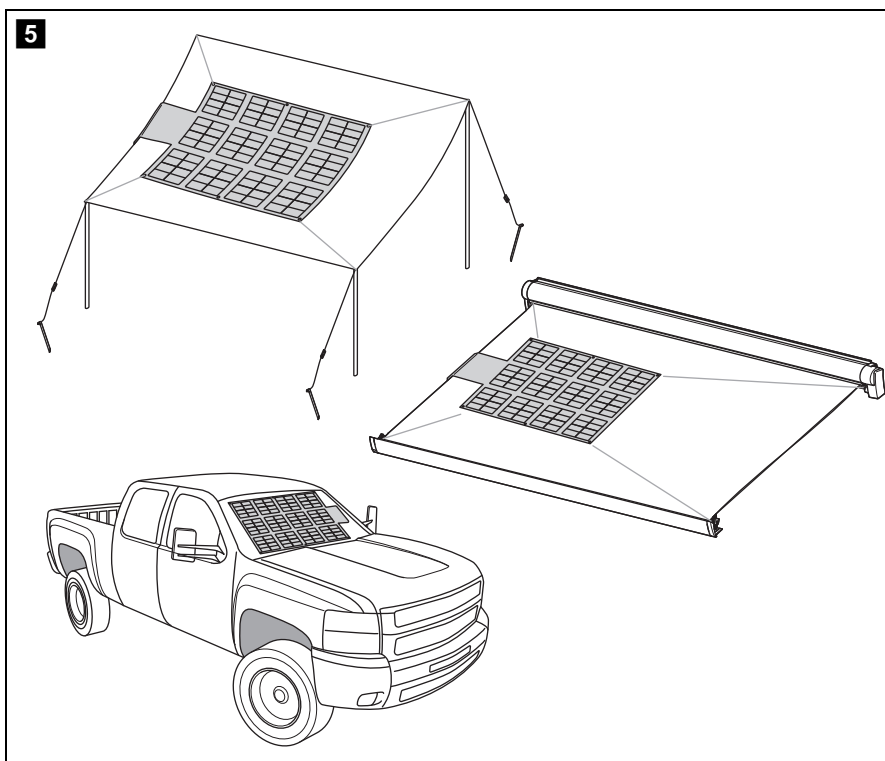


NOTICE!

Make sure that the solar blanket is always clean and dry (chapter "Maintaining and cleaning the product" on page 17).

6.1 Positioning the solar blanket

Eyelets on four corners and sides of the portable solar kit provide different mounting options. This solar blanket can be mounted on a vehicle, caravan or tent to provide shade and provide power generation as well. It is recommended to place the solar blanket north at 20 to 40 degree, which can provide the maximum power no matter at any season.



- Locate a clear area free from over hanging branches or obstructions.
- Remove the solar blanket from the carry bag.
- Lay the solar blanket on the mounting location. Fix the solar blanket at the eyelets.

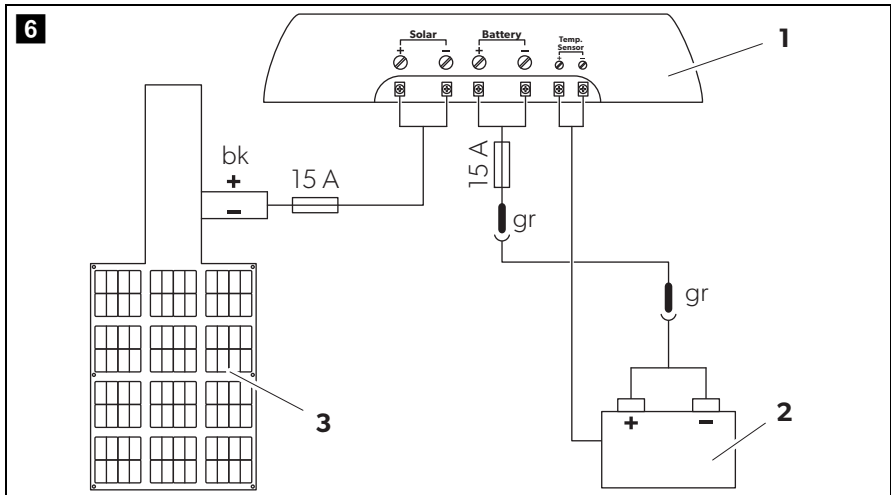
6.2 Connecting the solar blanket



NOTICE!

- Always observe the following connection sequence. Overvoltage can damage the electronics of the device.
 - **Connecting the solar blanket:** First, connect the Alligator clips to the battery, then connect the Anderson connections to the solar blanket.
 - **Disconnecting the solar blanket:** Disconnect the Anderson connections from the solar blanket first, finally disconnect the Alligator clips from the battery.
- Ensure that the battery clamps do not get in contact with each other.
- Only use the cable with Anderson plug and alligator clips supplied.
- Make sure that the polarity is correct.
- Make sure that the connection is tight and secure.

Connecting diagram



No. in fig. 6	Description
1	Solar controller
2	12 V --- battery
3	Solar blanket
gr	grey
bk	black

Connecting the solar charge controller

- Connect the red lead of the battery cable (grey Anderson connector) to the positive (+) battery terminal on the solar charge controller.
- Connect the black lead of the battery cable (grey Anderson connector) to the negative (-) battery terminal on the solar charge controller.
- Connect the red lead of the solar blanket cable (black Anderson connector) to the positive (+) solar blanket terminal of the solar charge controller.
- Connect the black lead of the solar blanket cable (black Anderson connector) to the negative (-) solar blanket terminal of the solar charge controller.

Connecting to a battery

- Connect the Alligator clips to the battery terminals. Connect the red lead with red clamp to the positive (+) battery terminal. Connect the black lead with black clamp to the negative (-) battery terminal. Ensure that the connection is secure and tight.
- Connect the grey Anderson plug to the grey Anderson socket of the extension cable.
- Connect the grey Anderson plug of the extension cable to the grey Anderson socket of the battery cable of the solar charge controller.
- ✓ The solar charge controller powers on.
The solar charge controller performs a self-test, a software version test, a rated voltage and current test and an external battery temperature test.

Connecting the temperature sensor

- Connect the temperature sensor wires to the solar charge controller and attach ring terminal to the battery.

Connecting the solar blanket

- Connect the black Anderson plug to the Anderson socket of the solar blanket.
- ✓ The battery is loading according to the charging status (see chapter “Monitoring the charging stages” on page 14).
- ✓ The  symbol indicates that the solar blanket is connected.

- Press and hold the Battery type button for 3 second to choose the battery type:
 - LiFePo4
 - LTO
 - GEL
 - AGM
 - WET
 - Calcium

Disconnecting and storing the solar blanket

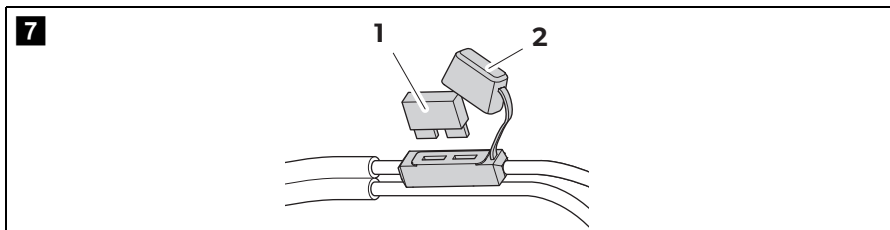
- Disconnect the Anderson connectors from the solar blanket first, finally disconnect the Alligator clips from the battery.
- Clean and dry solar blanket surface with damp cloth before folding and packing pack in to the bag (chapter “Maintaining and cleaning the product” on page 17).
- Put the solar blanket in a dry and cool place after using.

Replacing the fuse



NOTICE!

Disconnect the solar blanket before you replace the device fuse.



- Disconnect the solar blanket (see chapter “Disconnecting and storing the solar blanket” on page 13.)
- Remove the protective cover (2).
- Replace the defective fuse (1) with a new fuse of the same type and rating (15 A, automotive, fast acting).
- Refit the protective cover.
- Reconnect the solar blanket.

6.3 Operating the solar blanket

Setting the battery type



CAUTION!

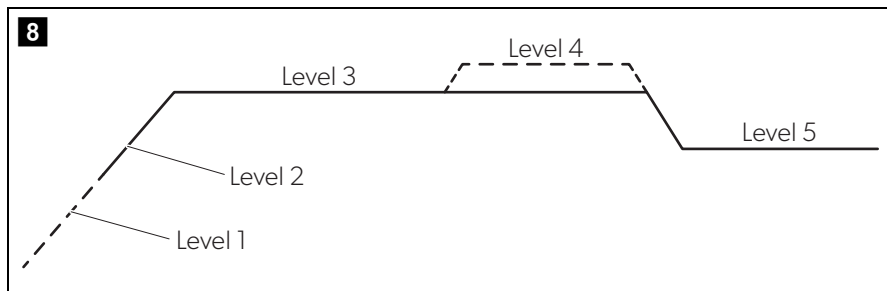
An incorrect battery type setting may damage your battery. Check your battery manufacturer's specifications to select the correct battery type.

The solar charge controller provides six battery types for selections: LiFePO₄, LTO, Gel, AGM, WET (conventional lead acid) and Calcium. The default setting is AGM.

- Press the **BATTERY TYPE** button for 3 seconds to enter the battery type selection mode.
- ✓ The battery type is shown on the LCD display.
- Press the **BATTERY TYPE** until the correct battery type is selected.

Monitoring the charging stages

You also can visually monitor your battery charging condition via a battery bar on the top of display. If the battery is charging, the battery bar will be flashing. If the battery is fully charged, the battery bar will turn on.



The unit has a 5-stage charging algorithm.

- Soft Charge **(1)**:
When batteries had an over-discharge, the controller will softly ramp the battery voltage up to 10 V.
- Bulk Charge **(2)**:
Maximum current charging until battery rises to Absorption charge.
- Absorption Charge **(3)**:
Constant voltage charging until battery is over 85%.

- Equalization Charge (4):
Only for WET battery or CALCIUM battery type. When the battery is deeply drained below 10 V, it will automatically run this stage to bring the internal cells as an equal state and fully complement the loss of capacity.
- Float Charge (5):
Battery is fully charged and maintained at a safe level.

A fully charged lead acid battery (GEL, AGM, WET battery) has a voltage of more than 13.6 V. A fully charged LiFePO4 or LTO battery has a voltage of 13.4 V.

The CHARGING STATUS LEDs and BATTERY CONDITION LEDs indicate the charging stage:

Charging stage	Charging status		Battery condition			
						
Soft Charge	ON	FLASH	OFF	OFF	OFF	ON
Bulk Charge	ON	ON	OFF	Subject to battery voltage:		
				< 11.5 V:		
				OFF	OFF	ON
				11.5 V to 12.5 V:		
				OFF	ON	OFF
				> 12.5 V:		
				ON	OFF	OFF
Absorption Charge	ON	ON	OFF	ON	OFF	OFF
Equalization Charge	ON	ON	OFF	ON	OFF	OFF
Float Charge	ON	OFF	ON	OFF	OFF	OFF

7 Troubleshooting

If you are unable to rectify the fault, get in touch with a specialist workshop.

Fault	Possible cause	Suggested remedy
Device does not function, ① LED does not light.	The device fuse is defective	Replace the device fuse, see chapter "Replacing the fuse" on page 13.
The ① LED is lit and the  LED flashes	No battery connected	Connect a battery.
The ① LED flashes.	The solar power is too weak.	Move the solar blanket into an appropriate position until it is exposed to sun. If the problem still remains, try later during peak sun power.
The ① flashes. The display flashes and indicates P01 .	The device is connected with reserve polarity.	Connect the device with correct polarity.
The ① flashes. The display flashes and indicates P02 .	The device is in over voltage status (>25.5 V).	Connect the device correctly.
Red, yellow and green CHARGING STATUS LEDs flash. The display flashes and indicates b01 .	Battery disconnected or less than 3.0 V.	The device switches off to protect the battery. Ensure that the battery is connected, inspect for loose wires and connections. Set LiFePo4 for Lithium ion phosphate batteries
Red CHARGING STATUS LED flashes. The display flashes and indicates b02 .	The battery is connected with reverse polarity.	Connect the battery correctly.
Red CHARGING STATUS LED flashes. The display flashes and indicates b03 .	Battery over voltage protection (>17.5 V) is activated.	Connect the device correctly.
Red, yellow and green CHARGING STATUS LEDs flash. The display flashes and indicates b04 .	Battery temperature is over 65 °C.	The device switches off. Wait until the battery has cooled down.
The display flashes and indicates otP .	Over temperature protection of the device is activated.	The device switches off. Wait until the device has cooled down.

8 Maintaining and cleaning the product



NOTICE!

- Before cleaning the solar blanket, please make sure your solar blanket is cool.
- Do not use any detergent to clean the solar blanket.
- Do not use sharp or hard objects or cleaning agents for cleaning as these may damage the product. Prevent scratches on the surface of the solar blanket.
- Do not use high pressure to clean the solar blanket.

- Regularly clean the dust on the solar blanket with mild soapy water and a damp cloth.

9 Warranty

The statutory warranty period applies. If the product is defective, please contact your retailer or the manufacturer's branch in your country (see the back of the instruction manual for the addresses).

For repair and warranty processing, please include the following documents when you send in the device:

- A copy of the receipt with purchasing date
- A reason for the claim or description of the fault

10 Disposal

- Place the packaging material in the appropriate recycling waste bins wherever possible.



If you wish to finally dispose of the product, ask your local recycling centre or specialist dealer for details about how to do this in accordance with the applicable disposal regulations.

11 Technical data

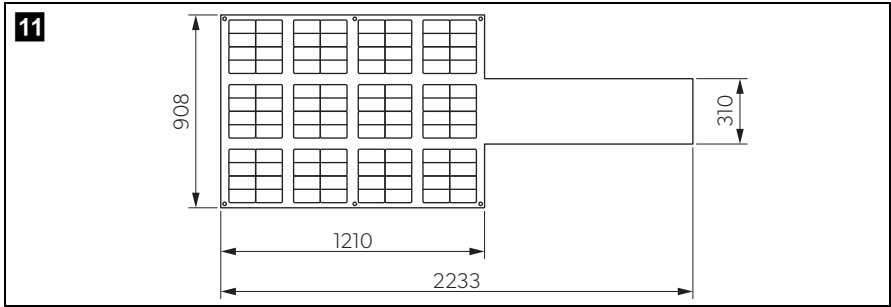
	PSB150
Peak power (varies according to ambient condition, UV radiation, temperature etc.):	154.4 W
Voltage at max. power (V_{mp}):	18.1 V
Current at max. power (I_{mp}):	8.53 A
Open circuit voltage:	21.6 V
Short circuit current:	9.13 A
Operating temperature:	0 °C to +85 °C
In-line fuse:	15 A, automotive, fast acting
Dimensions:	see chapter "Dimensions" on page 19
Net weight:	5.2 kg

Solar charge controller:

Nominal system voltage:	12 V ---
Normal input solar cell voltage:	15 V --- to 22 V ---
Max. input solar cell voltage:	25 V ---
Standby current consumption:	5 mA
Battery type:	LiFePO ₄ , LTO, GEL, AGM, WET, CALCIUM
Minimum battery start charging voltage:	3 V ---
Soft start charging voltage:	3 to 10 V --- $\pm$ 0.2 V ---
Bulk charge voltage:	10 to 14.0 V --- $\pm$ 0.2 V ---
Absorption charging voltage at 25 °C:	
– LTO battery:	14.0 $\pm$ 0.2 V ---
– GEL battery:	14.1 $\pm$ 0.2 V ---
– LiFePO ₄ battery:	14.6 $\pm$ 0.2 V ---
– AGM battery:	14.4 $\pm$ 0.2 V ---
– WET battery:	14.7 $\pm$ 0.2 V ---
– Calcium battery:	14.9 $\pm$ 0.2 V ---

Absorption to Equalizing or Float condition: – Charging current drops to: – Absorption charging timed out:	0.5 A ± 0.1 A 4 hours
Equalization charging active (only for WET or CALCIUM battery): – Battery voltage discharged to less than: – Automatic equalizing charging periodical: – Equalization charging voltage at 25 °C: – Equalization charging timer timed out:	10 ± 0.2 V= 28 days 15.5 ± 0.2 V= 2 hours
Float charging voltage at 25 °C: – For LTO and LiFePO4 battery: – For GEL, AGM, WET, CALCIUM battery:	13.4 ± 0.2 V= 13.6 ± 0.2 V=
Battery temperature compensation coefficient:	–24 mV/°C
Temperature compensation range:	–20°C to +50 °C
Operating temperature:	–25 °C to +50 °C
Enclosure:	IP65

Dimensions



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