

160W/260W/360W SOLAR BLANKET USER MANUAL

SH-BLKT-BC-1A / SH-BLKT-BC-2A / SH-BLKT-BC-3A

Please read this manual carefully before operation and maintenance,
follow all provided instructions, and keep it for future reference.

TABLE OF CONTENTS

Important Warning And Safety Instructions-----2

Personal Safety Precautions-----3

Maintenance Guidelines-----3

What's In The Kit-----4

Solar Optimization-----4

System Wiring-----5

Technical Specifications-----6

Troubleshooting-----7

Warranty-----8

IMPORTANT WARNING AND SAFETY INSTRUCTIONS

- Before operating the San Hima solar blankets, it is imperative that you thoroughly read and comprehend this manual. The installation should strictly adhere to the provided instructions. San Hima recommends that the blanket be installed by a suitably qualified person.
- Avoid excessive bending, hitting, or stepping on the solar blanket, as this may damage the cells and wiring, leading to short circuits, overheating, and reduced efficiency. Under no circumstances should you operate the unit if it has been smashed, pierced, or otherwise damaged.
- Avoid directly connecting the solar blanket to a battery. Always use a solar charge controller between the solar blanket and the battery to ensure safe operation.
- The MPPT controller is only compatible with lead-acid, AGM, GEL, calcium, or LiFePO₄ batteries. This solar blanket is not intended for charging non-rechargeable batteries, as it may result in user injuries or damage to the blanket and the controller.
- To minimize the risk of sparks, connect or disconnect the solar blankets to the charge controller before exposing them to sunlight. The solar blankets may generate voltage up to the rated open circuit value at the connection leads while unconnected.
- When exposed to light, unconnected blankets may generate voltages on their leads. During installation, connecting, or disconnecting, completely cover all blankets with an opaque material to reduce the chance of electrical sparks.
- When mounted on vehicles, including 4x4 vehicles, RVs, caravans, etc., the solar blankets are subjected to high wind and vibration forces during driving. Ensure secure attachment to the vehicle following all local and national safety standards.
- Do not use mirrors or other devices to artificially concentrate sunlight on the blanket. Partially shaded or partially obscured solar blankets will have reduced output, and can potentially damage the solar blanket.
- Keep the solar blanket away from liquids and chemical solvents. Do not immerse the solar blanket in water or wet it.
- Ensure that nothing sharp or heavy could potentially break or damage the solar blanket during transport or storage. Never place the solar blanket near fire or flammable materials.

- Clean the unit as necessary using a damp sponge or cloth. A mild, non-abrasive cleaning agent can be used to remove grime and dirt.
- Note that the solar blanket is not designed for use in series or parallel configurations, and this unit is not intended for commercial use.

PERSONAL SAFETY PRECAUTIONS

- This solar blanket is not intended for use by individuals, including children, with reduced physical, sensory, or mental capabilities, or those lacking experience and knowledge unless supervised or instructed on how to use the appliance by a person responsible for their safety. Children should be supervised to prevent any playful interaction with the appliance.
- Ensure complete eye and clothing protection while operating the solar blanket. Avoid touching your eyes when working near a battery.
- In case battery acid comes into contact with your skin or clothing, promptly remove the affected clothing and wash the impacted skin area with soap and water. If battery acid enters your eye, immediately flush the eye with running cold water for a minimum of 10 minutes and seek medical assistance without delay.

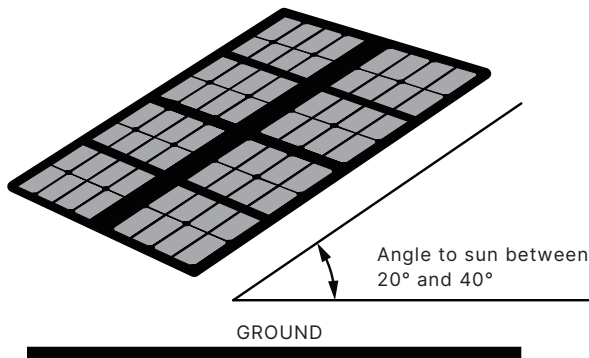
MAINTENANCE GUIDELINES

- To ensure optimal performance and longevity of your solar blankets, please adhere to the following maintenance recommendations:
 1. **Regular Inspection:** Conduct routine inspections of your solar blankets to ensure their surface is free from dust, dirt, and other debris.
 2. **Cleaning:** If necessary, clean the solar blanket surface using a damp cloth or an appropriate glass cleaner to remove any accumulated dirt or residue.
 3. **Structural Components and Electrical Connections:** Verify that all structural components and electrical connections are securely in place and free from any contaminants. Regularly cleaning these components is advisable to maintain efficiency.
- By consistently following these maintenance recommendations, you can optimize the performance of your solar blankets and contribute to their overall durability.

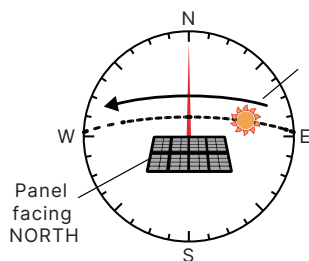
WHAT'S IN THE KIT

- 1 PC(s) San Hima Solar Blanket
- 1 PC(s) San Hima 20A MPPT Solar Charge Controller with Anderson Style Plugs
- 1 PC(s) 4.5m Extension Cable with Anderson Style Plugs
- 1 PC(s) Cable with Alligator Clips and Anderson Style Plug
- 1 PC(s) User Manual

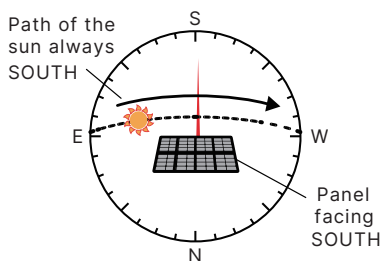
SOLAR OPTIMIZATION



To optimize the performance of San Hima solar blankets, it is ideal to position the blanket face directly towards the sun. However, in practice it is not possible to achieve this orientation at all times. San Hima recommends adjusting your blankets to an angle between 20° and 40° from the ground. This range ensures optimal total output throughout the day, irrespective of the season.



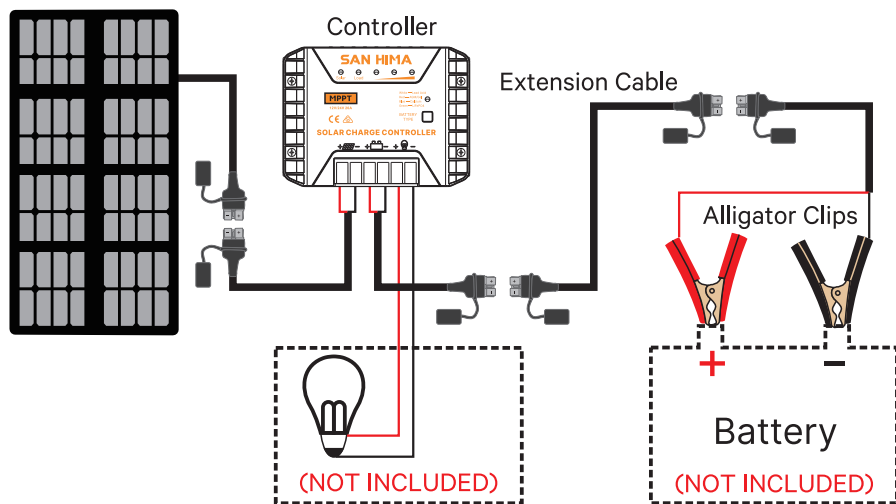
Southern Hemisphere



Northern Hemisphere

In the southern hemisphere, where the sun consistently resides in the northern half of the sky, positioning your blanket to face north guarantees the best angle for solar exposure throughout the day. Conversely, in the northern hemisphere, where the sun remains in the southern half of the sky, facing your blanket south ensures the most advantageous angle to capture sunlight effectively throughout the day.

SYSTEM WIRING



TECHNICAL SPECIFICATIONS

SOLAR BLANKET:

SKU	SH-BLKT-BC-1A	SH-BLKT-BC-2A	SH-BLKT-BC-3A
Cell Type	HPBC (Hybrid Passivated Back Contact)		
Cell Coating	ETFE		
Backing Material	Nylon		
Conversion Efficiency	24%		
Max. Power (PM)	160W	260W	360W
Open Circuit Voltage (VOC)	22.5V	28.2V	28.5V
Short Circuit Current (ISC)	9.9A	13.2A	17.9A
Max. Power Voltage (VMP)	17.3V	21.1V	21.3V
Max. Power Current (IMP)	9.2A	12.3A	16.9A
Max. System Voltage	36V	42V	42V
Power Tolerance	±5%		
Operating Temperature	-40°C~85°C		
Connector Type	Anderson-style Plug		
Certifications	CE		

CONTROLLER:

SKU	RPM-SH-BLKT-BC-MPPT
Battery Voltage Range	12V/24V
Max. PV Open Circuit Voltage	50V
Max. Solar Input Voltage	50V
Rated Charge Current	20A
Rated Discharge Current	20A
Max. PV Input Power	500W
Discharge Circuit Voltage Drop	≤0.3V
Self Consumption	≤8ma
No Load Current	<10ma
Standby Current Draw	≤4ma
Nominal Current Draw	≤10ma
USB Output	Type A+Type C; 5V/2.4A
Operation Temperature	-20°C~50°C
Storage Temperature	-30°C~70°C
Relative Humidity	≤90%

BATTERY VOLTAGE PARAMETERS

Battery Type	Lead Acid	AGM/GEL	Calcium	LiFePO4
Maximum Voltage	14.4V	14.7V	15.4V	14.3V
Reconnect Charging Voltage	13.2V	13.2V	13.2V	13.2V
Under Voltage Warning Voltage	10.5V	10.7V	11.4V	10.4V
Under Voltage Reconnect Voltage	11.5V	11.7V	12.4V	11.4V
Over Voltage Protection	16.5V	16.7V	17.4V	16.4V

STATUS INDICATION

INDICATOR	STATUS	MEANING
SOLAR	Steady ON	Solar panel voltage is higher than 16V
	OFF	Solar panel voltage is less than battery voltage + 1V
BATTERY	Any status	Number of indicators steady on indicates battery power
	The left indicator is flashing	Battery is nearly or already empty.
LOAD	Steady ON	The battery voltage is higher than Under Voltage Reconnect Voltage
	OFF	The battery voltage is lower than Under Voltage Reconnect Voltage

TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Load indicator is off	Battery is low, the load indicator will be on when the battery voltage is higher than 12V	Charge the battery
The MPPT controller does not turn on	Battery is insufficiently charged	Charge the battery
	Battery has been connected improperly	Check, and if necessary alter the battery's connection to the MPPT controller
	Battery fault	Charge the battery
Solar blanket doesn't work despite sufficient sunlight	Reverse polarity	Reconnect
	Loose connection	Reconnect
	Bad soldering of wires inside the junction box	Contact us
	Solar blanket malfunction	Contact us
Low power output	Loose connection	Reconnect
	Wrong tilt angle	Adjust the angle to capture direct sunlight
	Shadow	Remove any shadow covering the blanket
	Accumulation of dust	Clean, best on a regular basis
	High operating temperature	Ensure sufficient air circulation beneath the blankets

WARRANTY

San Hima ("Manufacturer") hereby provides a warranty to the original purchaser ("User") that its solar blanket, when purchased from the manufacturer, an authorized distributor, or dealer, shall be free from defects in material and/or workmanship during normal usage. This warranty is applicable from the date of sale and remains in effect for a duration of 2 YEARS (the "Warranty Period"). It is important to note that this warranty exclusively extends to the original purchaser and is specific to the San Hima solar blanket.

San Hima, at its discretion, will either replace the product or issue a refund, provided that the fault is found to have been caused by a design or manufacturing defect that results in the solar blanket's failure to perform as described. This limited warranty stands as the sole warranty applicable to this product, setting forth all the responsibilities assumed by San Hima in this regard.

Exclusion:

It is strongly advised that the installation of the solar blanket be carried out by adequately qualified technicians; failure to do so will result in the warranty being voided. Additionally, for enhanced clarity, this warranty expressly excludes coverage for defects, failures, and damages arising from the following:

- normal wear and tear.
- inadequate ventilation and insufficient maintenance.
- improper installation and storage.
- incorrect handling and transportation.
- unauthorized repair or modifications.
- intentional or accidental misuse, abuse, and neglect.
- contamination with hazardous substances, radiation, and water (unless explicitly stated otherwise by the Manufacturer to be waterproof).
- exposure to extreme hot or cold temperatures.
- force majeure events, including but not limited to fires, floods, earthquakes, hurricanes, severe weather conditions, wars, and acts of terrorism.
- usage on permanent sites or in commercial displays.

CLAIMS:

If a San Hima product is suspected of being defective, you'll need to provide proof of purchase (e.g. a screenshot of the order) and a picture and a video of the damaged goods in their entirety to sales@sanhima.com. If the product is found to be defective and covered by this limited warranty, the remedy is replacement or refund, at San Hima's option. No charges will be accepted for external labour or materials.