



USB Charging will be disabled when the battery is low (LVD)
(Check for low battery indicator LED - 20% Yellow LED Blinks)

USB CONNECTOR

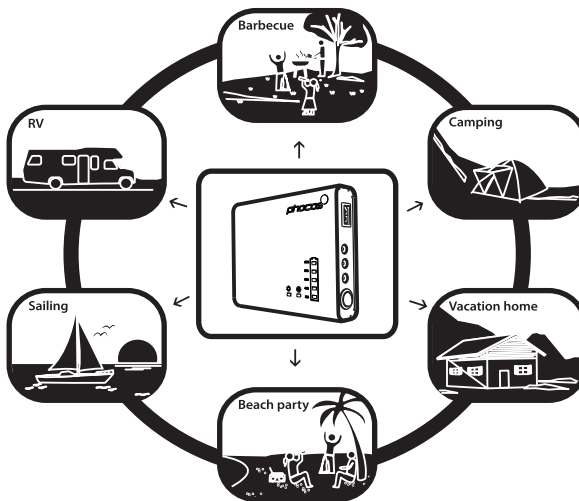
USB connector for 5.2V supply to small appliances like charging cell phones, compact portable computers, small music players; with up to 1000 mA of current consumption.

Warning: Do not connect the charging device anywhere else! USB-negative contact is connected to load negative.

Technical Data

Type	SHS-20W
Charging Type	Maximum Power Point Tracking (MPPT)
Battery Specification	
Battery Type	LiFePO4
Battery Voltage	12.8V
Battery Capacity	75Wh
Max. Charge Current	1300 mA
Max. Discharge Current	1300 mA
Max. Battery Voltage Limit	14.3V ± 0.2V
Low Voltage Disconnect	11.2V ± 0.3V
Back Up Hours ^①	1 lamp: 15 h, 2 lamps: 8 h, 3 lamps: 5 h
Panel Specification^②	
Panel Power	20Wp
Open Circuit Voltage (Voc)	22V
Voltage at max. power (Vmp)	18V
Current at max. power (Imp)	1.12A
Short circuit current(Isc)	1.21 A
Load Specification	
Load Terminals	DC jack 6.5 mm, 3 output terminals
Operating Voltage	11 - 15V
Output Power	3W - 3Nos
Light Color	6500K (Cool White)
Mobile Charging	USB type A, 5.2V, 1000mA
Others	
Ambient Temperature	0 to 50 °C while charging, -20 to 55 °C while discharging
Peak Efficiency	>90%
Idle Standby	< 10mA
Dimension (WxHxD) mm	375 x 200 x 130
Weight (approx.)	3.2Kg (without panel)
Ingress Protection	IP 20
Accessories	Panel with cable - 1 No ^③ ; DC LED lamp 3W - 3 Nos; E-27 Lamp holder assembly with switch - 3 Nos and mobile charging cable - 1 No.

APPLICATION

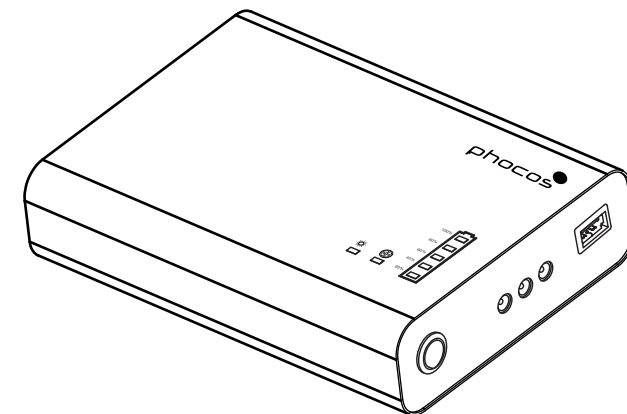


LIABILITY EXCLUSION

The manufacture shall not be liable for damages, other than mentioned in the manual. The manufacturer shall not be responsible if there has been service or repair carried out by any unauthorized person, unusual use, wrong installation.

Subject to change without Notice
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Phocos AG -Germany
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RoHs
ISO9001:2015



Solar Home System - SHS 20W User Manual

Dear Customer,

Congratulations in buying your Phocos Product! Please read the instructions carefully and thoroughly before using the product. Your new Solar Home System is a "state-of-the-art" device which was developed in accordance with the latest available technical standards. It comes with a number of outstanding features, such as:

- Maximum Power Point Tracking technology, which increases the efficiency of your PV system.
- Maintains constant current/ constant voltage for charging the battery.
- LFP batteries provides better power density and increased safety when compared to other lithium chemistries.
- The system is user friendly with plug and play operation.
- Clear and reliable display of battery status.
- Provided with USB mobile charging which includes iPhone, Androids, MP3 players etc.
- Easy installation either Wall or Table mounting
- Protection from over charge and deep discharge.
- Compact, portable and lightweight.
- Complete electronic protection.
- The Solar LED lamps provide high illumination levels with very low power consumption and a long lifespan.

IMPORTANT SAFETY INSTRUCTIONS

Please read the instructions and warnings in this manual carefully before beginning any installation.

Please do not disassemble or attempt to repair our products. Phocos products do not contain any user serviceable parts.

The information contained in this manual must be observed in its full extent.

MAINTENANCE AND INSTALLATION NOTES

When installing or working on the PV system, please disconnect the PV (solar) modules from the Product first, to prevent any damages to the product!

① Conditions apply: Back up time varies and depends upon the ambient temperature and operating conditions. The run time estimate does not account for mobile phone charging.

② Panel Specification may vary according to the manufacturer.

③ Panel comes in a separate box along with the product box.

Please verify that all cable/wire connections are done properly with the cables issued with the product that no water or humidity can ingress in order to avoid any bad or loose connections that would result in further damage.

- Keep the Solar panel clean from dust and dirt to maintain charging performance.
- Protect the product and lamps from rain and dirt.
- Don't use any other lamps other than specified lamps
- Never allow children under age of 3 to play with the product.

Don't place the product in hot surfaces above ambient temperature, if it exceeds the normal temperature the product gets warm. Never allow a spark or flame near the product.

DO'S

- ✓ Install the product in a ventilated area.
- ✓ For the first time after installation the product should be charged till the battery reaches full condition.
- ✓ Switch 'OFF' the product before maintenance.
- ✓ Install the solar panel in direct sunlight.
- ✓ Use Individual load switch to turn On/Off the load (Lamp).
- ✓ When the product is deep discharged, wake up the product in full sunshine.
- ✓ Battery has to be discharged and recharged at least once in a month for battery performance specially when product is not being used regularly.
- ✓ The SHS should be charged only through PV modules.

DON'T'S

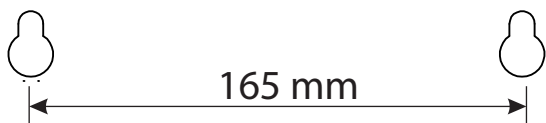
- * Don't open the product.
- * Do not allow water to drip or splash on the product.
- * Don't continuously Power on and Power off the product.
- * Do not connect AC LED lamps or other loads to the product.
- * Never try to extend size of cable supplied along with product by the manufacturer.

DESCRIPTION OF FUNCTIONS

The major principle of MPPT is to extract the maximum available power from PV module by making them operate at the most efficient voltage. The product protects the battery from being overcharged by the solar array and from being deep discharged by the loads. The SHS has a number of safety and display functions.

MOUNTING & CONNECTING

The product 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 product must be installed on a non-flammable surface only.



Remark: Connect the product by the following steps described to avoid installation faults.

- Mark two positions of the drill holes on the wall by using the paper installation position scale.
- Drill the two holes and hammer the expansion tube.
- Fix the given screws on the expansion tubes and mount the product.

INSTALLATION

1. Choose the Location of the Solar panel and Permanently install the solar panel on the roof.
2. Mount the Product on either wall or Table as per the Mounting Procedure.
3. Permanently mount the wire from the solar panel to the product.
4. Choose the locations of the 3 lamps in the house.
5. Mount the lamps in position as the switch can be placed near for accessing.

STARTING UP THE CONTROLLER

As soon as the product is switched ON, it starts a self test routine. Then the display changes to normal operation. Solar Panel should be placed directly facing the sunlight to charge the product and ensure that the product is connected to the panel. Charging is not effective if the panel is kept in shade. SHS will charge slowly on cloudy / unclear days.

Climatic Conditions

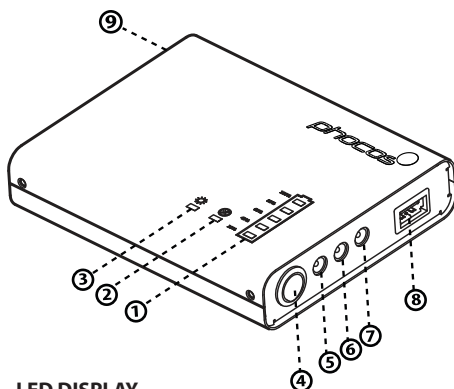
Climatic Conditions	Charging Time (hrs)
Full Sunny days	8 Hrs With Solar Charging 20Wp
Cloudy days	24 Hrs With Solar Charging 20Wp

* After deep discharge, wake up the product in full sun shine.

RECOMMENDATIONS FOR USE

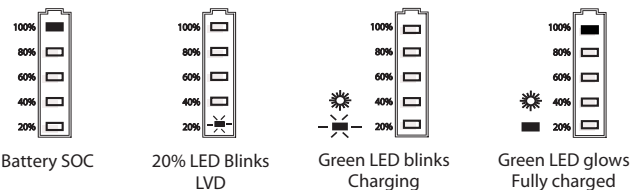
The product gets slightly warm during normal operation. If there is insufficient ventilation or the surrounding environment is too hot the product will prevent over-heating by dis-connecting the load and charging. The product does not need any maintenance or service. Remove the dust with a dry tissue.

PRODUCT DESCRIPTION



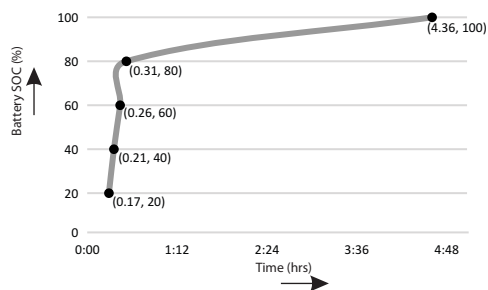
1. Battery Status Yellow LED
2. Fault Indication Red LED
3. Solar Charging Green LED
4. System ON/OFF Switch
5. Output - 1
6. Output - 2
7. Output - 3
8. Mobile Charger
9. PV Input

LED DISPLAY



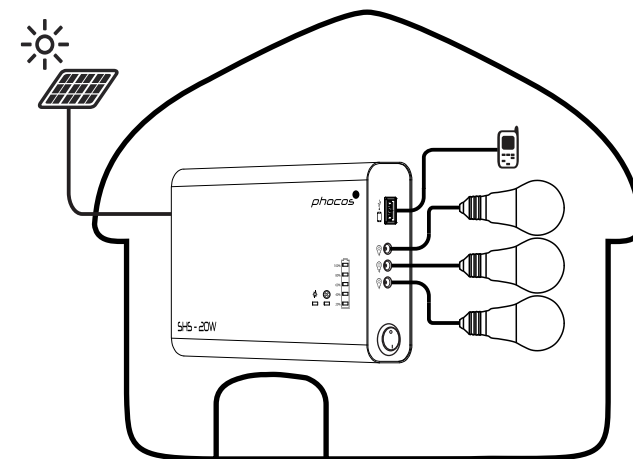
In Normal Operation, the controller shows the state of Charge of the battery and the solar panel activity.

CHARGING SOC CURVE



Maximum Charging is done on the 80% SOC LED and 100% SOC LED. The SOC back up time can vary in accordance with the user's ambient.

PRODUCT DESCRIPTION



ERROR DESCRIPTION

Error	Display	Reason	Remedy
No indication		<ul style="list-style-type: none"> ○ Switch is turned off ○ Battery is less than LVD 	<ul style="list-style-type: none"> ○ Switch on the product ○ Connect the Panel ○ Charge the battery full
Product is not charging during the day		<ul style="list-style-type: none"> ○ Switch is turned off ○ Panel disconnected ○ Panel cable is faulty 	<ul style="list-style-type: none"> ○ Switch on the product ○ Ensure that the panel is connected ○ Ensure that the cable is not damaged
Red Led blinks		<ul style="list-style-type: none"> ○ Overload ○ Improper Loads may be other than manufacturer specified 	<ul style="list-style-type: none"> ○ Remove overload, connect proper loads and wait as the product reconnects in 20 sec ○ Ensure that you connect only manufacturer specified lamps
Red Led Glows		<ul style="list-style-type: none"> ○ Load Short Circuit 	<ul style="list-style-type: none"> ○ Switch off all loads and remove short circuit ○ Reset the product (Turn OFF/ON)

Blinking Led off Glowing

Note:

When the battery reaches LVD, the product goes to shutdown mode, to conserve battery power, the product can be activated by charging through modules.