



# SOLAR STIK®

## OPERATOR MANUAL FOR THE 6KW INVERTER



**P/N 16-0503201**



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## Revision History

Section	Page(s)	Description	Date
All		Initial release	2023 Nov 20

# Important Product Safety Information and Instructions

This manual contains important safety instructions that must be followed during the installation and operation of this product. Read all instructions and safety information contained in this manual.

While this product is designed for indoor/outdoor operation, the user interface (control panels) must not be exposed to rain, snow, moisture, or liquids. Close and latch and/or lock the cases when the equipment is unattended.

The equipment is field serviceable to a limited degree. If repair is needed, contact Solar Stik, Inc. or your field service representative (FSR) for assistance in diagnosis and identification of the proper repair and parts.

Exercise caution when handling or operating equipment. Live power may be present.

## Safety Information Labels

Your safety and the safety of others is very important.

Always read and obey all safety messages.



This is the safety alert symbol. This symbol alerts you to potential hazards that can kill you or hurt you and others. All safety messages will follow the safety alert symbol and the word “DANGER”, “WARNING”, or “CAUTION”. These words are defined as:



**DANGER** Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

## Limitations on Liability

Since the use of this manual and the conditions or methods of operation, use, and maintenance of this product are beyond the control of Solar Stik, this company does not assume responsibility and expressly disclaims liability for loss, damage, or expense—whether direct, indirect, consequential, or incidental—arising out of or anyway connected with such operation, use, or maintenance.

Due to continuous improvements and product updates, the images shown in this manual may not exactly match the unit purchased.

This equipment **CAN BE USED FOR CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT** or devices; however, without limiting the generality of the foregoing, Solar Stik makes no representations or warranties regarding the use of the System in connection with life support systems or other medical equipment devices.

## Fire Hazard

### Fire Types

**Class A fire** - Fires in ordinary combustibles such as wood, paper, cloth, trash, and plastics.


**Class B fire** - Fires in flammable liquids such as gasoline, petroleum, oil, and paint.

**Class C fire** - Fires involving energized electrical equipment such as motors, transformers, and appliances. Remove the power source and the class C fire becomes a class A or B fire.

## Recommended Fire Extinguisher

NSN 4210-00-288-7219 Fire Extinguisher, Carbon Dioxide, 10 lb

Carbon dioxide is a liquefied gas, which is highly effective fighting class B and C fires. These extinguishers are ideal for areas where contamination and/or cleanup are a concern, such as data processing centers, labs, and telecommunication rooms.

 <b>WARNING</b>
Only CO <sub>2</sub> (carbon dioxide) fire extinguishers should be used with Solar Stik equipment.



### Using the Fire Extinguisher

When using the extinguisher on a fire, remember PASS:

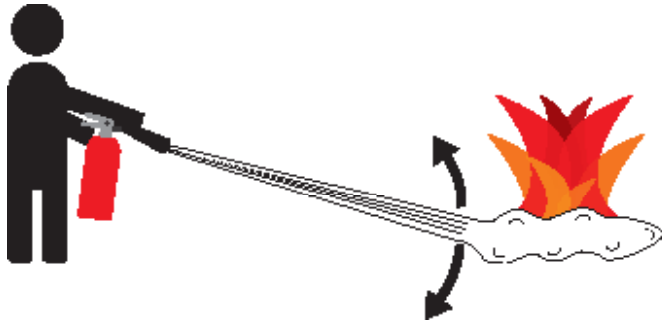
**P**ull the pin.

**A**im the nozzle or hose at the base of the fire from a safe distance.

**S**queeze the operating lever to discharge the fire extinguishing agent.

**S**weep the nozzle or hose from side to side until the fire is out. Move forward or around the fire as the fire diminishes.

Watch the area for reignition until the cause has been fixed.



Use Sweeping Motion

These additional cautionary steps will ensure your safety:

- System components should not be operated in standing water.
- Close and latch the component lids if it is precipitating.
- System cables should not be routed through standing water.
- Cable connections should remain dry.
- Unused ports on System components should be covered when not in use to reduce the possibility of water intrusion.

## **⚠ WARNING**

Standing water around the electrical equipment and/or intrusion of water into the System components can increase the risk of electrical shock.

## **⚠ WARNING**

The [product] is NOT GFCI protected.

## **Electric Shock Hazard**

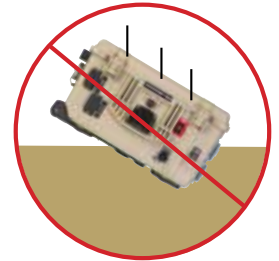
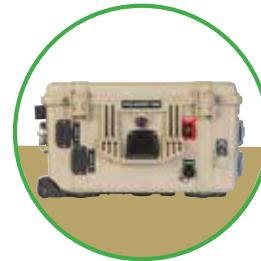
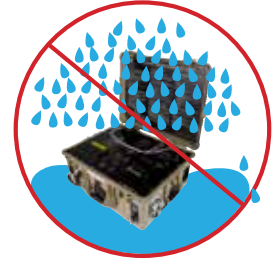
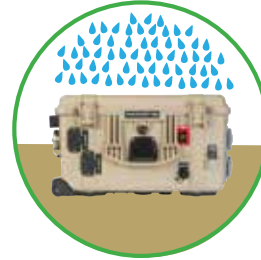
**HIGH VOLTAGE:** System components, solar arrays, and generators may produce lethal line voltages. Extreme care should be taken to protect against electrocution. Always work with another person in case an emergency occurs. Disconnect power before performing maintenance. Wear safety glasses whenever working on any part of a System that requires exposure to mechanical or direct electrical contacts.

# Environmental and Handling Precautions

All Solar Stik components are ruggedized, yet there are a few things the operator can do to prevent failures and prolong the operational life of the product.

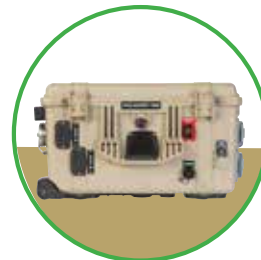
## Water

- All Solar Stik equipment is designed for outdoor operation, even during periods of inclement weather.
- If outdoor operation is necessary, the lids of all components should be closed and latched whenever possible.
- The user interfaces (inside Faceplates or panels) are NOT waterproof. However, they can withstand light exposure to moisture for short durations (dew, mist, light rain).
- Do not operate equipment in or around standing water.
- Do not lay power distribution cords (extension cords) in standing water.



## Impact

- All Solar Stik equipment is ruggedized for punishing conditions; however, as a general rule, hard impacts should be avoided.
- Equipment should not be dropped onto hard surfaces at a height greater than one foot when transporting or during operation.



## Dust

- All Solar Stik equipment is designed for operation in climates where high levels of dust or other particulates may exist.
- Air intake filters should be cleaned once per month, or more frequently when conditions warrant.
- As a general rule, minimize exposure to high levels of particulates by exercising common-sense placement.



## Heat

- Heat and solar loading reduce efficiency and life expectancy. Shade products (except solar panels) to prevent the negative effects of heat.

# The Inter-Connect System

The Solar Stik System is comprised of three distinct types of technologies:

- Energy Storage
- Power Management
- Power Generation

All of the individual Solar Stik components that operate in these categories utilize a unique connection architecture, known as the Inter-Connect Circuit.

The Inter-Connect Circuit is the skeletal backbone of the Solar Stik System's DC power network, and it uses a simple, polarized, locking connection that is common throughout the architecture. All Solar Stik components, including Power Managers, Energy Storage, and Generation are compatible with the Inter-Connect Circuit.

Using a common, polarized connector allows rapid "Plug & Play" scaling of components, adaptation of capabilities within the architecture, technology-refreshment, and swapping of components when conditions warrant.

## Communicating Voltage

All Solar Stik components that operate on the Inter-Connect Circuit use one value to successfully operate in concert – Battery Voltage.

The Inter-Connect Circuit communicates Battery Voltage to all of components on the network, allowing them to independently coordinate their respective functions. Voltage is used to trigger actions such as Automatic Generator Start/Stop (AGS) function, renewable power delegation, power distribution timing, and more.

## The Importance Of Proper Setup

While there is no "unsafe" way to make connections using a common polarized connector, proper setup of the Inter-Connect Circuit is critical in order to properly communicate Voltage to all points in the System, ensuring all of the components can operate in concert to provide seamless power.

Setup can also directly impact how power is metered in the network. Several Power Management devices such as Power Hubs and PRO-Verters will meter current as it flows through the circuit, providing critical real-time data for the operator that can be used to troubleshoot, verify system performance, and make programming/architectural changes based on evolving conditions. Consult the System Operator Manual for a connection schematic specific for a particular application.

## Circuit Breaker Protections

The Inter-Connect network is protected from overloads and short circuits through a network of circuit breakers strategically placed throughout the circuit. It ensures that the potential for a reverse polarity connection within the circuit is minimized. If a problem occurs in a leg of the Inter-Connect Circuit, the affected leg will disconnect from the primary network, leaving the other circuits functioning. If a major failure occurs in the circuit, then the entire network will shut down.

### The Inter-Connect Plug

- Polarized
- 100 A maximum current
- 24 VDC connection only
- Mechanically “locks” into place
- Rotate knob clockwise to lock, counterclockwise to release
- Can be repaired or modified in the field



Figure 1. Inter-Connect Plug



# GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

## Introduction

The 6 kW Inverter is designed to maximize efficiency and minimize energy consumption from the battery bank by incorporating a Power Saver feature which allows the inverter to draw power only when it senses a load, therefore significantly reducing idle consumption. The Inverter has a LCD display that will communicate battery status including voltage and amperage when the inverter is not connected to PRO-Verters.

The 6 kW Inverter is a pure sine wave inverter that combines a 6000 kW inverter, battery charger and an AC auto transfer switch. The unit is equipped with three Inter-Connect ports allowing connection of Energy Storage Modules (ESMs) and PRO-Verters via an Inter-Connect strip. The Inverter is equipped with a 230 VAC Output. The unit is set at 50 Hz and has surge rating of 18000 W and a LCD control panel located on the inside of the module.

## Features and Functions



Figure 2. 6kW Inverter front exterior

	Description	Connector	Voltage	Amps
A	24 VDC ESM (x3)	Inter-Connect Port	24 VDC	100 A
B	Automatic pressure release		-	A

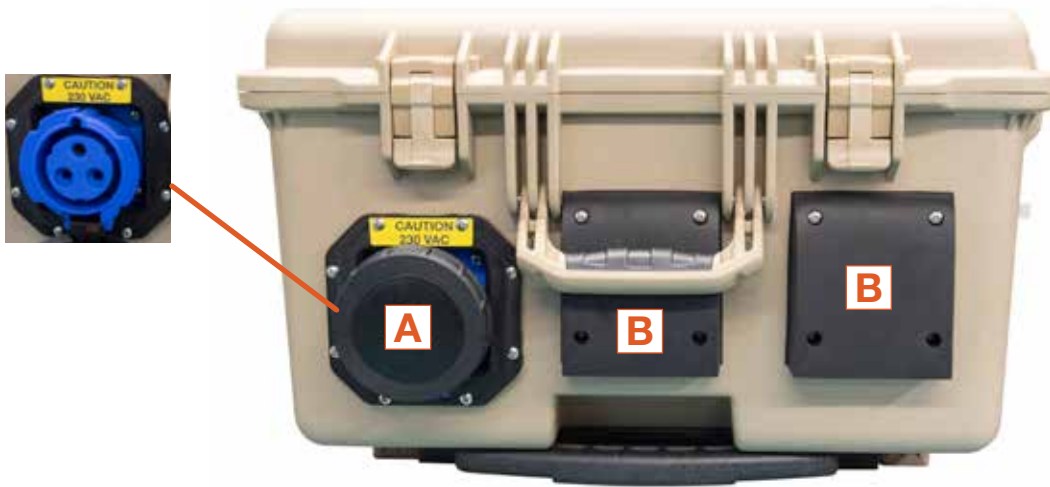


Figure 3. 6kW Inverter right side exterior

	Description	Connector	Voltage	Amps
A	AC OUTPUT	230 VAC (NEMA 5-20R)	230 VAC	25 A
B	Intake Vents		-	-
C	Exhaust Vents		-	-

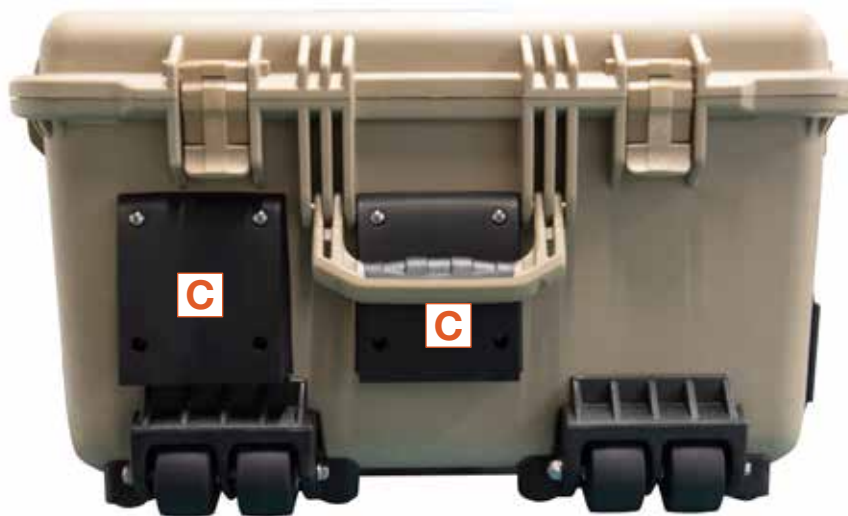


Figure 4. 6kW Inverter left side exterior

# OPERATING PROCEDURES

## Connecting 6kW Inverter to ESMs and VAC Input

Use the provided Inter-Connect cables P/N 13-1000246 to connect the Inverter to the System. Connect the Inter-Connect cables via the three 24 VDC ESM ports. Use the Inter-Connect cables to connect the Inverter to the DC bus via an Inter-Connect strip or a PRO-Verter, depending on the System. Connect all loads to the 230 VAC Output. Please refer to the System Diagrams provided by Solar Stik on specific connections.

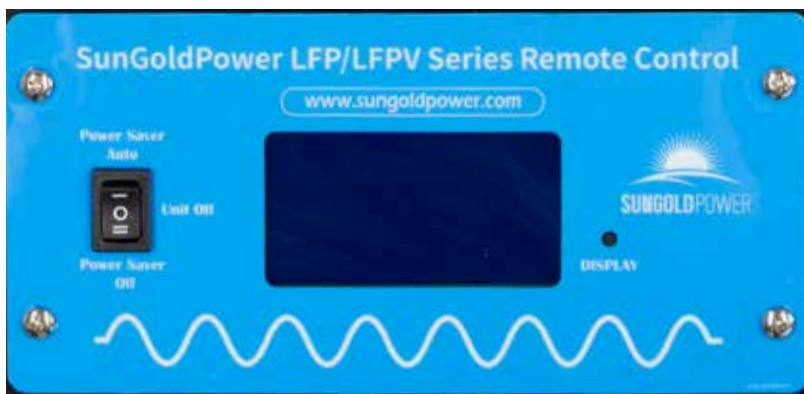


Figure 5. 6kW Inverter LCD display panel and control

The Inverter's Power Saver Auto setting is factory set to detect loads for 250 ms every 3 seconds.

The Inverter will be powered off when the Unit Off setting is used.

The Inverter's Power Saver Off setting should be used when Inverter power is desired without a requirement to conserve battery power.

# MAINTENANCE INSTRUCTIONS

## Preventive Care and Maintenance

**Note:** The function and efficiency of all electronic equipment is related to and dependent upon the temperature at which it is operating. It performs optimally within a narrow temperature range and less so as the temperature falls outside of that range. **Heat will cause the Inverter to derate.** Please use the following measures to mitigate against heat and other environmental effects:

- Shade the Inverter from direct sun exposure and shelter it from the elements as much as possible.
- Keep the case lid and Inter-Connect covers closed to prevent water/dust intrusion.
- Check the integrity of electrical connectors on a monthly basis.
- Turn off electrical appliances when they are not in use. This will save power, allowing more power to be available when it is needed.
- Clean the air filters of the Inverter air intake vents monthly. Wash them with water, dry them thoroughly, and place them back in the intake vents. The filters must be cleaned more frequently when high winds are frequent and particulate levels are high. See below.

## SUPPORTING INFORMATION

Maintaining maximum airflow in the Inverter is critical for normal operation. Reduced airflow increases internal heat and subsequent reduced performance of all internal components.

There are two (2) air intake vents and filters on the Inverter (Figure 3). The louvered vent cover can be removed by unscrewing the 4 screws that secure the fan shroud and then gripping and pulling it away from the case. The provided replacement filter can be pressed and snapped into place. The filter can also be cleaned if necessary. After exposing the filter, lift them from the vent and wash thoroughly with water, dry thoroughly and reinstall the filters and louvered vent covers. Ensure that the leading edge of the louvers are facing downward. Re-attach the fan shroud by securing with the original four screws.

## Transporting Components

The 6kW Inverter has wheels and an extendible pull handle, enabling it to roll easily on appropriate surfaces. There are no transport restrictions for these components, which are safe for all modes of transportation, including land, sea, and air.



Figure 6. 6kW Inverter left side view of wheels used for transport

# SPECIFICATIONS

GENERAL	
Operating Voltage	230 V
Input Battery Voltage Range	20.0 VDC- 31.0 VDC
Internal cooling	Forced Convection
User Interface	Remote On/Off Switch with LCD display
Case	Pelican 1600
Warranty	1-year materials and workmanship

Weights and Dimensions (L x W x H)	
Weight	113 lb (51.3 kg)
Dimensions	32.1 x 20.5 x 12.3 in (81.5 x 31.2 x 52.1 cm)

Inverter Specifications @ 77 °F (25 °C)	
Nominal AC Output Voltage	230 V
Rated Current	25 A
Output Frequency and Accuracy	50 Hz (+/- 0.3%)
Continuous Output Power	6000 W
Efficiency	88% (Peak)
Transfer time	10 ms (Max)
Waveform	Pure Sine Wave

Connections	
Input(s)	(2) 24 VDC Inter-Connect port*
Output(s)	(1) 230 VAC (NEMA 5-20R)

\*Deltran 224-0061-BK

Safety	
Breaker(s)	30A
Overvoltage Protection	Yes
Overcurrent Protection	Circuit Breaker
Overtemperature Protection	Warning alarm and overtemperature shut down

## ABOUT SOLAR STIK, INC.



SOLAR STIK®

### Mission Statement

Saving lives across the globe through innovative power solutions

### STIKopedia

[STIKopedia](#) is a compilation of everything you would ever want to know about portable Hybrid Power Systems, including the philosophy and mechanics of high-efficiency circuits, and the individual technologies used to create them.

### Solar Stik Training and Education

- **Solar School (St. Augustine, FL)** provides an introduction to the design and support of small-scale, renewable-energy, power generation systems, with detailed explanation of system components. Advanced configuration options with hands-on deployment of actual systems will enhance student understanding.
- **Solar Stik New Equipment Training (on site)** teaches Hybrid System configuration options with hands-on deployment of actual systems to enhance student understanding.

Solar Stik Training Courses are tailored to the specific needs of the students. To schedule Solar Stik Training or to learn more about the curriculum, please contact us.

### Contact

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