WAGAN® TECH

Item No. / Artículo Nº / Article n° 2547

SOLAR e POWER™ CUBE 1500 PLUS

User's Manual • Manual de Usuario • Guide d'Utilisation

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CE BC

User's Manual—Read before using this equipment

Item No. 2547

ENGLISH

SOLAR e POWER™ CUBE 1500 PLUS

MOBILITY • RAPID SETUP • INSTANT POWER

ENGLISH

CONTENTS

INTRODUCTION

Congratulations on your purchase of Wagan Tech®'s Solar e Power™ Cube 1500 Plus. As supplied, the Solar e Power Cube is a balanced electrical system that can power AC appliances and operate and charge a variety of communication and entertainment devices. In an emergency, it can boost a dead car battery. On the job site, it can power tools where no power lines or generators exist. At night, it can power a variety of light sources from DC spotlights to AC floodlights. At the campground it can power an RV Microwave oven, water pumps and entertainment equipment. The Solar e Power Cube is expandable: As your needs change, external batteries and solar panels can be added to the system to increase run time. This flexibility preserves your investment in Solar e Power Cube.

The internal battery, the heart of the system, is of high quality and with proper care and frequent charging will last for years. Wagan Tech, with proven technology DC to AC inverters, has crafted the internal power inverter for use with the Solar e Power Cube.

A supplied automatic AC to DC Charging Adapter efficiently charges and maintains the Solar e Power Cube's internal batteries.

Read and understand all warnings, cautions and notes included in this manual before using the Solar e Power Cube. Follow instructions provided by your vehicle and other device manufacturers intended to be used with the Solar e Power Cube.

Keep these instructions for future reference.

Fully Charge The Solar e Power Cube Before First Use.

WARNINGS, CAUTIONS AND NOTES

WARNINGS identify important safety concerns when operating this equipment. Failure to follow these warnings could result in personal injury or loss of life.

CAUTIONS identify conditions that can cause damage to equipment

NOTES identify operating details.

Warnings—General

Shock or fire hazard—The Solar e Power Cube generates the same potentially lethal AC power as a normal household wall outlet. Treat it with the same respect that you would any AC outlet.

Explosion Hazard—Do not use this product around flammable fumes or gasses, such as in the bilge of a gasoline powered boat, or near a propane tank. Do not use Solar e Power Cube in an enclosure containing automotive-type lead-acid batteries. These batteries, unlike the sealed battery pack in the Solar e Power Cube, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections or disconnections.

When working on electrical equipment, always make sure that someone is nearby to help you in an emergency

Heavy Lifting—This unit weighs about 84 pounds (38 kg). Proper care should be taken when lifting the unit. Two people should lift this product using the two shape-molded handles located on the side of the Solar e Power Cube.

Limitations on Use—The Solar e Power Cube has not been tested for use with life support systems or other medical equipment or devices. The user assumes all risk if medical devices are used with this product.

Temperature Limits—Do not expose Solar e Power Cube to temperatures in excess of 104 °F (40 °C) or below 32 °F (0 °C)

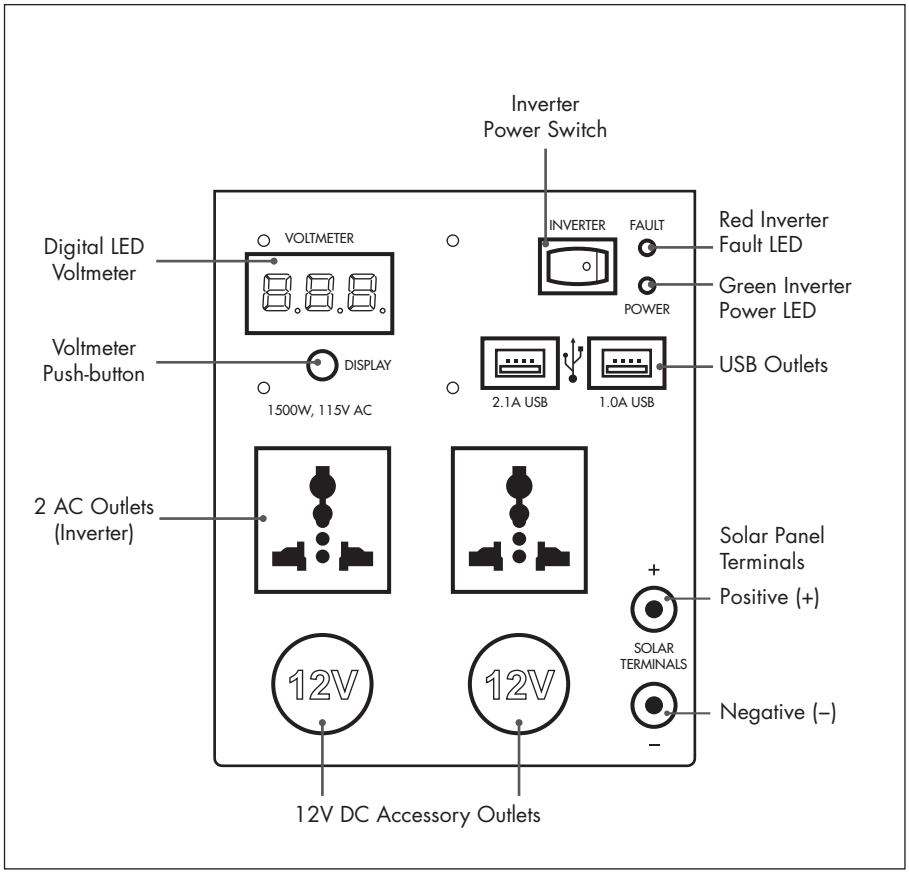
Unit is Not Waterproof—Do not expose this unit to rain or heavy moisture.

MAJOR FEATURES

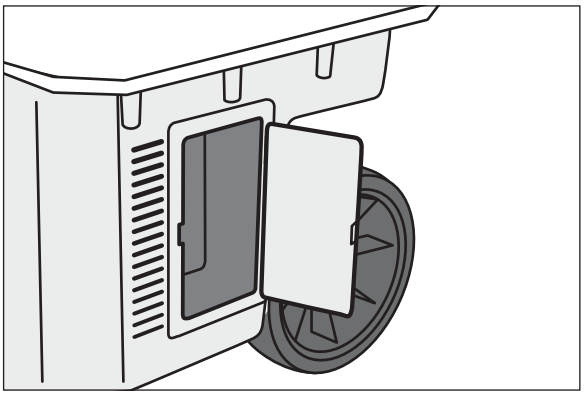
- 1500 watt Power Inverter (3600 watts peak)
- Two AC Outlets
- Two 12 volt Automotive Outlets for powering DC appliances (loads to 15 amps)
- Two USB Power Ports for charging/operating cell phones, PDAs, and MP3 players
- AC Charging Adapter with 5 amp output
- DC Charging Adapter (fused)
- Digital LED Voltmeter for checking battery status
- Battery Status Push-Button
- Battery Disconnect Switch
- Solar Panel Terminals to connect solar panels to the internal Solar Charge Controller
- Terminals to connect additional batteries
- Storage Hatch for chargers and cables
- Shape molded handles for easy lifting/wheels for positioning the Solar e Power Cube.
- 100Ah Gel/AGM hybrid battery for long life
- 80 Watts (5 × 16 watts) of solar panels for charging the internal battery.

CONTROL PANEL

The Control Panel contains a Digital LED Voltmeter for reading battery status, a Battery Status Push-Button to turn on the meter, Inverter ON/OFF switch, two AC Outlets, two USB and two 12 volt Accessory Outlets. Two LEDs indicate the operating condition of the Inverter. The green Power LED, when lit, indicates normal operation and that AC is present at the outlets. The red Fault LED indicates the Inverter is shut down because of any of the following reasons: over voltage, under voltage, over temperature or overload. Refer to the Troubleshooting section to resolve the problem. Two terminals allow additional solar panels to be connected to the internal Solar Charge Controller. The Battery Disconnect Switch is located to the left of the control panel. A Storage Hatch contains the DC and AC Charging Adapters.



Control Panel



Storage Hatch

Digital LED Voltmeter (Battery Status)

The Digital LED Voltmeter provides the user with the current charge state of the internal battery. It is the user's responsibility to periodically monitor the battery charge and to recharge the battery after each use. Recharge every three months even if the Solar e Power Cube is not used.

NOTE: Battery status (voltage) is accurate with Charging Adapters disconnected

1. Press and hold the Battery Status Push-Button for 3 seconds.
2. The Digital LED Voltmeter (Battery Status meter) will display the battery voltage.

= 13.5V DC	Battery is fully charged
≥ 12.6V DC	Battery is ready for use
≤ 12.0V DC	Battery needs some charging
< 10.5V DC	Battery is discharged, charge immediately

100Ah Gel/AGM Hybrid Battery

The Solar e Power Cube is equipped with the latest in battery technology. Supplied batteries combine the charging characteristics and compatibility of AGM valve regulated, sealed lead-acid batteries with the improved performance of gel batteries in low discharge rate and high ambient temperature applications.

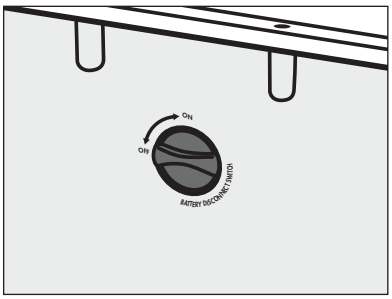
These batteries are electrically compatible with AGM batteries for expansion and also follow AGM charge characteristics. The gel component in them improves performance in low discharge applications. It is recommended that only AGM batteries be used for long term expansion or replacement because they are more compatible with portable applications and do not spill or leak.

CAUTION—BATTERY LIFE:

Repetitive quick deep discharging of any rechargeable battery will reduce the capacity and life of the battery. Frequent charging will preserve battery life.

Battery Disconnect Switch

A Battery Disconnect Switch allows the user to turn off the battery whenever the Solar e Power Cube is not in use and to be stored for a prolonged period of time. This helps preserve the battery's charge. Also, it is recommended to turn this switch off whenever transporting or moving the Solar e Power Cube to prevent any electrical hazard caused by excessive vibration. The Battery Disconnect Switch is located to the left of the control panel. For early models, the fan will operate when the Battery Disconnect Switch is closed (ON). For later models, fans operate when the Inverter is turned on.

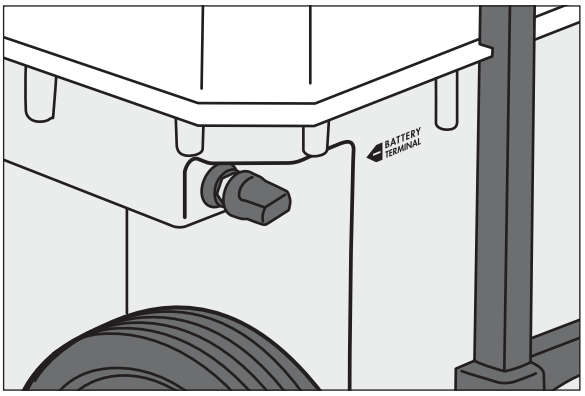


CAUTION—LIVE BATTERY TERMINALS:

When the Battery Disconnect Switch is closed (ON), the Battery Terminals are connected to the internal battery. Proper care must be taken to keep Battery Terminals covered (insulated) at all times when not in use.

External Battery Terminals

Red and black terminals labeled "Battery Terminal" are located above each wheel. Battery Terminals can be used for DC load applications greater than 15 amps, such as jump starting a small motor vehicle with user-supplied jumper cables. Care must be taken to ensure that the battery is not over-discharged. When using the Battery Terminals for high current output for a prolonged period of time, it is recommended that the Inverter switch be turned ON to operate the cooling fan. The Battery Disconnect Switch must be on to use the Battery Terminals. Battery Terminals can be used to connect additional (external) batteries to increase capacity of the battery bank. The illustration that follows shows the Negative battery terminal.



Negative (–) Battery Terminal

CHARGING THE SOLAR E POWER CUBE

Make Sure The Solar e Power Cube Is Fully Charged Before First Use.

It is important to charge the Solar e Power Cube for 24 hours before initial use. Recharge after each use. When storing for long periods of time, it is recommended to charge the battery once every 3 months. Failure to follow these instructions can damage the battery and reduce the battery's ability to hold a charge

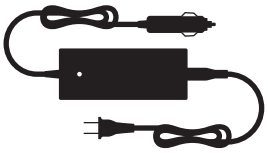
CAUTION—RISK OF DAMAGE TO BATTERY:

- All lead-acid batteries must be charged at least every 3 months, especially in warm environments. Leaving a battery in a discharged state, or not charging every 3 months risks permanent damage.
- Do not attempt to charge Solar e Power Cube battery if it is frozen. A frozen battery should be gradually warmed to 32 °F (0 °C) before charging.
- Caution: Don't undercharge the Solar e Power Cube battery.
- Repeated incomplete charging reduces battery life.
- During charging, if the battery status button is pressed, the voltage displayed will be that of the charger.
- To read battery voltage the user MUST first disconnect the charger from the unit.
- Press the battery status push button. If the reading shows less than 13.5 volts, then continue charging.
- If the battery reading is above 13.5 volts, allow the battery to rest for one hour.
- During rest period the battery will "settle" to its real voltage. After the rest period, take the battery status. This reading will display an accurate battery voltage.

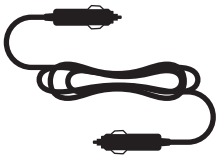
- Make sure the Solar e Power Cube is fully charged before first use.

CHARGING METHODS

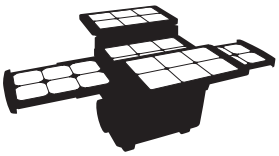
Factory supplied equipment allows the Solar e Power Cube to be charged using:



AC Charging Adapter



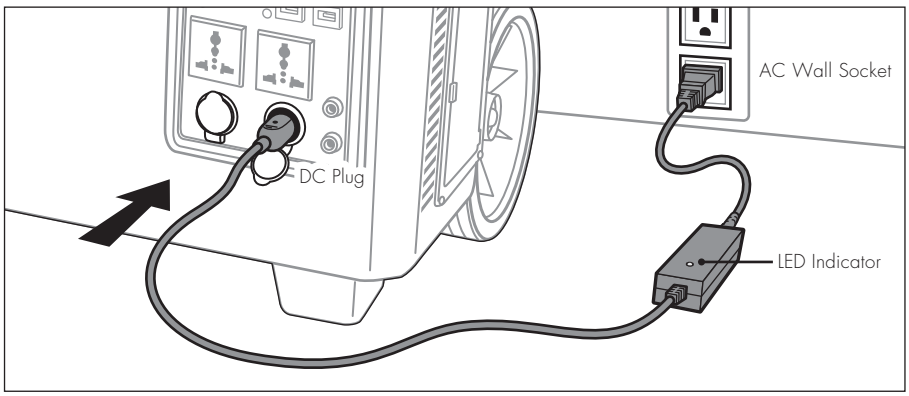
DC Charging Adapter
(Charging from your vehicle as you drive)



Solar Panels

AC Charging Adapter

The Solar e Power Cube is supplied with a fully automatic AC Charging Adapter. The indicator light on the top of the adapter shows red when the battery is charging and green when the battery has reached a full charge. The charger will continue to trickle charge the battery to maintain a full charge when the green light is on. The Charging Adapter has a wide range of input voltages and automatically adjusts to 115V or 220V depending on the AC source. Note that initial AC charge can take up to 48 hours. The AC Charging Adapter connects to the Solar e Power Cube through either DC Accessory Outlet located on the control panel.



Plug AC Charging Adapter into wall socket

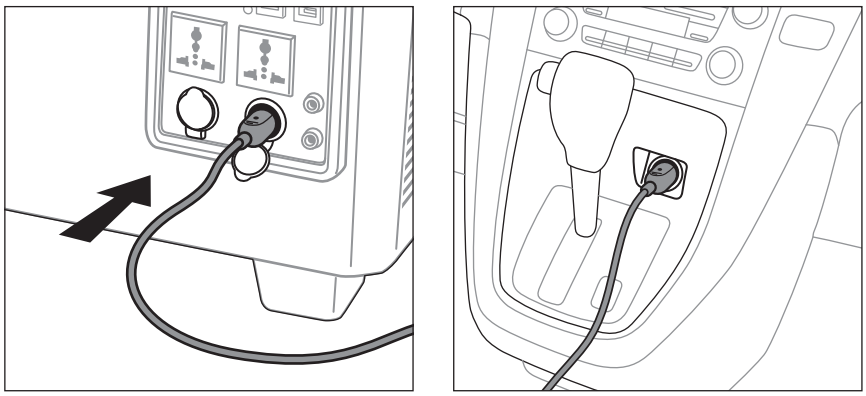
To charge the Solar e Power Cube using the AC Charging Adapter:

MAKE SURE ALL SOLAR E POWER CUBE SWITCHES ARE SET TO OFF.

1. Connect the AC Charging Adapter to an AC wall socket.
2. Insert the charger's DC plug into the Solar e Power Cube's DC Outlet.
3. Turn ON the Battery Disconnect Switch.
4. Charging is complete when the light on the AC charger turns green.
5. After charging the battery, disconnect the adapter from the AC wall socket first, then from the DC Outlet.
6. Turn OFF the Battery Disconnect Switch if the Solar e Power Cube is not in use.
7. Store the AC Charging Adapter in the Storage Hatch.

DC Charging Adapter

The DC Charging Adapter is a cord with a fused DC accessory plug at both ends. Both plugs are fused at 15 amps to prevent damage if there is an inadvertent short. Refer to the maintenance section to replace a fuse if necessary.



Plug DC Charging Adapter into vehicle DC accessory socket

To charge the Solar e Power Cube using the DC Charging Adapter:

ONLY USE THE DC CHARGING ADAPTER SUPPLIED WITH THIS UNIT. DO NOT CONTINUOUSLY CHARGE FOR MORE THAN 16 HOURS USING THE DC TO DC METHOD.

1. Note that the engine must be running while charging the Solar e Power Cube to avoid discharging the vehicle's battery.
2. Make sure all Solar e Power Cube switches are set to OFF.
3. Plug the DC Charging Adapter into the Solar e Power Cube's DC Outlet.
4. Plug the other end of the DC Charging Adapter into the vehicle's accessory socket (cigarette lighter socket).

5. Turn ON the Battery Disconnect Switch
6. Periodically remove one DC plug and check the Digital LED Voltmeter to determine when charging is complete (usually 13.5V is considered fully charged)
7. After charging the battery, disconnect the DC Charging Adapter from the vehicle accessory socket first, then from the Solar e Power Cube DC Outlet.
8. Turn OFF the Battery Disconnect Switch if Solar e Power Cube is not in use.
9. Store the DC Charging Adapter in the Storage Hatch.

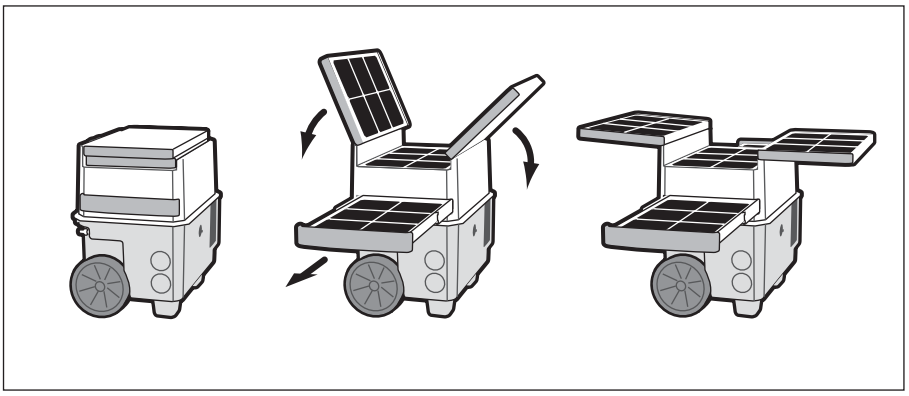
Do not leave the Solar e Power Cube connected to your vehicle's DC socket when the engine is turned off.

CAUTION—EQUIPMENT DAMAGE:

- While the Solar e Power Cube is being charged with the DC Charging Adapter from your vehicle, do not operate the Inverter with a load of over 100 watts. Further, do not plug in or operate any DC appliance from the Solar e Power Cube that requires more than 10 amps. Either action may blow a vehicle fuse.
- Always remove the DC Charging Adapter from the vehicle's DC socket before starting the vehicle.
- Disconnect the Solar e Power Cube from the vehicle's DC socket when the engine is turned off to prevent discharging the vehicle's battery.
- Always remove the DC Charging Adapter from the vehicle's DC socket before starting the vehicle.

Charging With Solar Panels

The Solar e Power Cube is supplied with five 16W solar panels (80 watts). The top two panels are hinged at the sides of the Solar e Power Cube and the lower two panels slide out from the center of the Solar e Power Cube. The panels must be fully opened/extended to allow maximum exposure to sunlight.



Extending Solar Panels

CAUTION—Keep any objects from resting on the solar panels. This will reduce panel exposure to sunlight and slow battery charging. Heavy objects can damage the solar panels.

Factory supplied solar panels have a combined rating of 80W, however, actual charging power may vary depending on environmental factors and sun intensity in your region. The approximate charging time for the Solar e Power Cube using the supplied solar panels is 18 hours of peak sunlight. Additional solar panels may be connected to reduce charging time. The internal Solar Charge Controller is rated at a maximum of 20A. Do not connect more than 300W of solar panels, including the 80W panels that are attached. Doing so will damage the Solar Charge Controller and void the warranty. Additional solar panels must have the same voltage ratings as factory supplied panels. (See panel specifications at the rear of this document).

CAUTION—SOLAR CHARGE CONTROLLER AMPERAGE LIMIT:

The Solar Charge Controller is rated at a maximum of 20A. Do not connect more than 300W of solar panels, including the 80W panels that are supplied. Doing so will damage the Solar Charge Controller and void the warranty.

Solar Panel Positioning

To ensure maximum power from the solar panels, position the panels perpendicular to the position of the sun. For best results, the solar panels should be in line with the expected path of the sun. Panel placement varies depending on your location. It is recommended that panel positions are checked and adjusted every 3 hours to ensure solar absorption is optimized.

CAUTION—EQUIPMENT DAMAGE:

When adding solar panels, make sure the solar panels are rated for 12V systems. If you are connecting multiple solar panels to the Solar Panel Terminals, make sure the combined voltage is no greater than 17V DC.

Do not connect more than 300W (total) of solar panels, including the 80W panels that are attached. Doing so will overload the Solar Charge Controller and prevent the controller from charging.

Make sure all air vents are not blocked while the Solar e Power Cube is in use. It is essential for maintaining optimum performance.

OUTPUT POWER

Using the AC Outlet Power Receptacles

The Solar e Power Cube's Inverter can operate most AC appliances or a combination of appliances up to 1500 watts. The Inverter is capable or handling up to 1500 watts for an extended period of time when additional batteries are connected. However, additional batteries will not increase the Inverters wattage capability beyond 1500W. Operating time (run time) is dependant on the AC load (watts) and the charge and condition of the Solar e Power Cube's internal battery and any connected external batteries. Low wattage AC loads and a full battery charge result in longer operating times. Be sure to turn off or disconnect any AC appliance not in use.

Converting DC battery power to AC generates heat. To minimize heat buildup and possible thermal shutdown, remove obstacles blocking or hindering airflow between the intake and exhaust sides of the Solar e Power Cube. Ambient temperatures above 25 °C will reduce the Inverter's ability to cool effectively, thus affecting operating times.

This Inverter produces Modified Sine Wave (MSW) AC. The waveform differences can be seen below. Both waveforms have the same electrical energy, however some average reading AC voltmeters can not properly read MSW. Readings on a non-TRUE RMS meter will display up to 30 volts lower voltage than sine wave AC.

Pure Sine Wave

Modified Sine Wave

CAUTION—MODIFIED SINE WAVE:

- Some rechargeable devices are equipped with a separate AC charger. These devices are likely to operate properly with this Inverter. Rechargeable devices that have built-in chargers (see device owner's manual) may not operate properly with this type of Inverter.
- Some motorized devices may operate at excessively elevated temperature when used with this Inverter. During first use with this Inverter, check for excessive motor temperature. Abnormally elevated temperature of the motor is an indication that they should not be used with this Inverter.

- Do not use the following with modified sine wave inverters:
    - Small battery-operated appliances like flashlights, razors and night lights that can be plugged directly into an AC receptacle to recharge.
    - Some chargers for battery packs used in power hand tools. These affected chargers display a warning label stating that dangerous voltages are present at the battery terminals.

To use the AC Power Inverter:

1. Turn ON the Battery Disconnect Switch
2. Connect the AC appliance or appliances to either AC Outlet.
3. Turn the Power Inverter ON by positioning the switch to the "•" ON position.
4. When the Inverter Power Indicator LED is green, the Inverter is operating.
5. Turn on one AC appliance and observe the Power Indicator and FAULT LEDs.
    - If the LED remains green, proceed to turn on the second appliance.
    - If the Power Indicator LED continues to remain green, then both appliances are operating properly.
    - If the red FAULT LED light is lit, then remove all loads and restart the inverter
    - If the Power indicator LED is not lit, then reduce the AC load. If the Inverter is still not operating, refer to the Troubleshooting table at the end of this User's Manual.
6. After appliance use, turn OFF the Inverter switch
7. Remove AC appliance plug(s) from the AC Outlets on the Solar e Power Cube
8. Recharge the Solar e Power Cube as soon as convenient.

Note: The external cooling fan operates whenever the Inverter is on. The cooling fan helps maintain Solar e Power Cube internal temperature when products with high power requirements are in use.

12V DC Accessory Outlets

DC Accessory Outlets can power a DC load up to 15 amps each. Overloading a port will result in tripping a self-resetting circuit breaker. Removing the overload automatically restores power to the DC Accessory Outlet once the circuit breaker has cooled.

CAUTION—Do not insert an automotive cigarette lighter into the Outlet. There is no pop-out feature and excessive heat may damage the Outlet.

To use an Accessory Outlet:

1. Open the dust cover over the DC Accessory Outlet.
2. Insert the 12V DC accessory plug into the DC Outlet.
3. Turn ON the Battery Disconnect Switch
4. Operate the appliance as usual.

5. After use, disconnect the accessory plug from the DC Accessory Outlet and store the accessory.
6. Replace the DC Outlet's dust cover.
7. Turn OFF the Battery Disconnect Switch
8. Recharge the Solar e Power Cube as soon as convenient.

External Battery Terminals

The Solar e Power Cube Battery Terminals can be used to power DC loads greater than 15 amps. Proper care should be taken, however to prevent the load from over-discharging the Solar e Power Cube's battery. Jump starting a vehicle involves very high current that can cause damage to person and property. Extra care MUST be taken to prevent any accidents. Always make sure the Inverter switch on the front panel is turned OFF and all DC and USB devices are disconnected before attempting to connect to or jump start using the Battery Terminals. Engine cranking should be done in three-second bursts. If the engine does not start after seven attempts, discontinue and look for other problems.

AC OPERATING TIME USING INVERTER

Below are typical AC products that can be operated by the Solar e Power Cube with estimated operating times. The operating times will vary depending on the internal battery charge level, ambient temperature and the actual AC product being operated. The Solar e Power Cube will not continuously operate AC appliances rated at more than 1500 watts, such as air conditioners or motors over 12 amps. Operating times can be extended if external batteries or chargers are connected to the Solar e Power Cube.

AC Powered Products*	Watts	Estimated Run time [1]
Radio	4	250 hours
Compact Florescent Light	20	50 hours
Laptop Computer	65	13 hours
Ceiling Fan	100	9 hours 30 minutes
Desktop Computer with 15" monitor	200	4 hours 18 minutes
Sony® Playstation® 3 Video Game Console	200	4 hours 18 minutes
40" LCD TV	200	4 hours 18 minutes
½" Drill [2]	750	45 minutes
Microwave Oven [2]	1000	30 minutes
Coffee Maker	1500 (max output)	10 minutes

* *Power usages listed are averages. Check your appliance rating for more accurate time estimates.*

1. *Operating times assume a fully charged battery and ambient temperature of 25° C. Actual results may vary based on model/brand used.*

2. *Assumes continuous operation*

DC OPERATING TIME

Below are typical DC accessories that may be operated by the Solar e Power Cube. Operating time will vary depending on the battery charge level and the specific accessory being operated. Operating times can be extended if external batteries or chargers are connected to Solar e Power Cube.

DC Powered Products*	Watts	Estimated Run time [1]
Smartphone	6	160 hours
Tablet Computer	12	80 hours
Portable Cooler	30	30 hours
Air Compressor	100	9 hours, 30 minutes

* *Power usages listed are averages. Check your appliance rating for more accurate time estimates.*

1. *Operating times assume a fully charged battery and ambient temperature of 25° C. Actual results may vary based on model/brand used.*

JUMP START WARNINGS

Flooded lead-acid batteries can release explosive gasses. Failure to follow instructions may cause property damage, explosion hazard and/or personal injury.

- Follow the connection sequence outlined below, paying special attention to the polarity. The battery's positive terminal is typically identified as being larger in diameter than the negative terminal. In most vehicles, it has a red wire or red terminal cover connected to it. Do not proceed until you are sure you have identified the positive terminal.
- Do not attempt to jump start while wearing vinyl clothing. Static electricity sparks may be produced when vinyl clothing is rubbed.
- Remove any metallic jewelry, such as rings, bracelets, necklaces and watches while working with a lead-acid battery. A battery short-circuit can cause severe burns.
- Wear complete eye protection. Do not touch eyes while working near or with a battery. Battery acid can cause blindness and/or severe burns.
- Do not smoke while jump starting.
- Never charge or jump start a frozen battery.
- To prevent short circuits and arcing, never allow the metal ends/tips of clamps (positive and negative) to touch each other or connect to the same piece of metal.
- The Solar e Power Cube is for use with 12V systems only.
- Jump start a vehicle in a well ventilated area.

- Excessive engine cranking can damage the vehicle's starter motor. If the engine fails to start after seven attempts, discontinue the jump start procedure and look for other problems that may need to be corrected.

JUMP START PROCEDURE WITH USER-SUPPLIED JUMPER CABLES

User supplied jump start cables can be connected to the high power DC Battery Terminals for boosting a 12V engine starting battery. Jump start cables are available from most auto parts stores. Review the Jump Start Warnings above and follow the instructions in sequence for a Negative grounded system (typical on most vehicles)

1. Review the Jump Start Warnings above
2. Make sure the Solar e Power Cube is fully charged.
3. Turn off the vehicle ignition and all accessories.
4. Make sure the vehicle is in park/neutral and the emergency brake is applied.
5. Make sure the Battery Disconnect Switch is OFF, and the Inverter switch on the control panel is OFF. Remove any plugs connected to the Accessory Outlets or USB ports.
6. Position the Solar e Power Cube a convenient distance from the vehicle's battery and make sure the jump start cables will reach the vehicle battery without coming in contact with any moving parts of the engine.
7. Remove the covers from the Battery Terminals and place them in the Storage Hatch.
8. With user-supplied jump start cables, securely connect the RED (+) cable clamp to the red Battery Terminal on the Solar e Power Cube.
9. Connect the other "vehicle" end of the jump start cable's RED (+) cable clamp to the positive battery terminal.
10. Connect the BLACK (–) cable clamp to the BLACK (–) Battery Terminal on the Solar e Power Cube.
11. Connect the vehicle end of the jumper cable's BLACK (–) cable clamp to the vehicle's chassis or engine block. Do not connect the black negative clamp directly to the negative battery terminal.
12. Turn ON the Battery Disconnect Switch.
13. Allow a few minutes for the Solar e Power Cube battery to trickle charge the vehicle's battery.
14. Turn ON the vehicle ignition switch and crank the starter in three-second bursts until the engine starts.
15. If the vehicle fails to crank after seven tries, disconnect the jump start cables in reverse order of steps 8–11. Investigate for additional reasons the engine will not start.
16. After the vehicle starts while the cables are still connected, run the motor at fast idle for 5 minutes to fast charge the Solar e Power Cube's battery. After charging, remove the jumper cables in reverse of steps 8–11.
17. Turn OFF the Battery Disconnect Switch.

Connection To a Positive Grounded Vehicle

If the vehicle to be started has a positive grounded system (positive battery terminal connected to the chassis), substitute the following steps to the instructions above:

10. Connect the positive (+) red clamp to the vehicle chassis or a solid, non-moving metal vehicle component. DO NOT clamp directly to the positive battery terminal or a moving part.
11. Connect the negative (–) black clamp to the vehicle battery's negative terminal.

VEHICLE BATTERY BOOSTING USING THE DC CHARGING ADAPTER

CAUTION—Do not leave the DC Charging Adapter connected to the vehicle's lighter socket when starting the vehicle. Remove the DC Charging Adapter before starting the vehicle. This will prevent the vehicle's DC socket fuse from blowing.

In some cases when the vehicle battery has enough power to crank the engine, but not enough to start the vehicle, the DC Charging Adapter can be used to provide enough charge to the vehicle's battery to start. Make sure the Solar e Power Cube is fully charged. The following procedure outlines this process:

1. Make sure the Inverter switch is OFF and all appliances have been disconnected from the Accessory Outlets and USB ports.
2. Turn ON the Battery Disconnect Switch.
3. Plug one end of the DC Charging Adapter to your vehicle's cigarette lighter (accessory) socket. You may need to switch the ignition key to the "Accessory" position to supply power to the lighter socket. Be sure to turn off any lights or accessories such as radio or A/C fan that may be operating from the vehicle's battery.
4. Plug the other end into either of the two DC Outlets on the Solar e Power Cube control panel.
5. Wait 15 minutes while the Solar e Power Cube trickle charges you vehicle's battery.
6. Remove the DC Charging Adapter from the vehicle's cigarette lighter socket before attempting to start the engine.
7. If your vehicle engine cranks but does not start, investigate for other problems.
8. Store the DC Charging Adapter in the Storage Hatch.
9. If the engine does not crank, follow the jump start procedures in the previous section.
10. Charge the Solar e Power Cube as soon as possible.

POWER EXPANSION OPTIONS

Adding Batteries to the System

For extended operating time, additional batteries may be added in parallel using the Battery Terminals located above the wheels. Connect 12V AGM batteries into the system for long-term

use. Connecting flooded, GEL or lead–calcium batteries can, over time, result in uneven charge and discharge between the internal and external batteries, a battery damaging condition. You may temporarily connect flooded, GEL or lead–calcium batteries to the Solar e Power Cube. It is important that you only connect same voltage (12V) batteries in parallel. Reverse polarity connections can cause an explosion. Connecting external batteries to the Solar e Power Cube in series could cause damage to the system and void the warranty. It is recommended that adding batteries be performed by a qualified person. If in doubt, a user-provided voltmeter may be needed to verify voltage and polarity of external batteries to be connected to Solar e Power Cube.

CAUTION—EXTERNAL BATTERY:

- When adding batteries to the system for long-term use, you must use 12V AGM batteries. Using different construction or chemistry batteries can damage components.
- The supplied 5 amp rated AC charger has a total amp hour limit. External batteries may not exceed 240 amp hours. Total internal and external amp hour rating should not exceed 360 amp hours.
- It is recommended to use at least 6 AWG cable or larger to connect additional batteries to the Solar e Power Cube when drawing full power from the Inverter. Heavy cables reduce voltage loss in the cables. Typical automotive jumper cables are sufficient.
- Install 100A fuse in positive line.

External Battery Connection Procedure

1. Turn OFF the Battery Disconnect Switch.
2. Locate the Battery Terminals above the wheels.
3. Install 100A fuse in positive line.
4. Loosen the Battery Terminal covers and connect the batteries using either ring terminals or jumper cable clamps. Make sure the connection is secure.
5. With a voltmeter, verify that the battery voltage is correct at the terminals.
6. Turn ON the Inverter and observe the external battery voltage.
7. Turn ON the Solar e Power Cube Battery Disconnect Switch if batteries are connected.

CAUTION—BATTERY DISCHARGE:

With the Battery Disconnect Switch OFF, the Digital LED Voltmeter shows external battery voltage to the Inverter. It is important to monitor the external battery voltage to prevent battery over-discharge.

Bypassing The Internal Battery

The Solar e Power Cube's internal battery can be bypassed to use the Inverter or battery charging functions without using the internal battery. This feature can be used if the internal battery is not available to power AC or DC appliances. To bypass the internal battery:

1. Turn OFF the Battery Disconnect Switch.
2. Connect external batteries to the Battery Terminals.

3. Operate the Solar e Power Cube as normal depending on your needs.

Note: Do not exceed 80A (960W) current drain when bypassing internal battery.

ADDING SOLAR PANELS

There are two ways to add more panels to the Solar e Power Cube. One way is to add panels using the internal Solar Charge Controller observing the controller's wattage/amp limits. If the Solar e Power Cube has external batteries with capacities greater than 100 amp hours, adding additional solar panels with total wattage greater than 300 watts can be accomplished by using solar panels with an external controller.

Using The Internal Solar Charge Controller

Additional solar panels can be connected to the Solar e Power Cube using the Solar Panel Terminals. Adding solar panels can reduce battery charging time. The internal Solar Charge Controller is rated at a maximum of 20A with panel voltages between 16 to 22 volts. Do not connect more than 300W of solar panels, including the 80W panels that are supplied. Doing so will cause an overload on the Solar Charge Controller and cease the charging process.

User-Supplied External Controller and Solar Panels

Additional solar panels, if equipped with their own solar charge controller, can be connected via the Battery Terminals. However it is recommended that total power charging the internal batteries does not exceed 10 amps with the Battery Disconnect Switch ON (closed).

If external batteries, solar panels greater than 300 watts and an external solar charge controller are to be connected to the Solar e Power Cube via the Battery Terminals, the Battery Disconnect Switch must be OFF (open) to avoid overcharging the internal battery.

MAINTENANCE

Maintaining the Solar e Power Cube in good operating condition is relatively simple. Charge the battery until full as often as possible and keep all surfaces free of dust and dirt.

Cleaning

With the Solar e Power Cube disconnected from all electrical cords and the fans OFF, you may carefully vacuum the vents to remove dust.

The solar panels should be periodically cleaned during extended use and before storing. Check your panels weekly or following a storm to make sure no damage has occurred.

- Check for dirt buildup or bird droppings.
- Using a soft brush, remove dust or droppings from the panels.
- Wipe surface area of solar glass and frame with a soft damp cloth. Use mild dish soap if necessary.
- Dry the panels with a soft cloth. Solar panels are more efficient when they are clean.

- Check wiring or cables that are attached to the solar panels. Wire or cables may become loose from turbulent weather conditions.
- Store panels when not in use.

Fuse Replacement—DC Charging Adapter

The DC Charging Adapter comes equipped with one 15A quick blow fuse inside each plug end. To replace a fuse, simply unscrew the head of the plug and remove the fuse. If blown, replace with a 15 amp fuse of the same type and rating.

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
No AC output, Green LED is not lit, Voltmeter reads below 10 volts	Battery voltage too low	Reduce AC load and charge the Solar e Power Cube battery
	Excessive AC load	
No AC output, no displays lit	Battery Disconnect Switch is OFF	Turn ON Switch
No AC output, 12 volt outlets operate, USB ports operate. Inverter Switch is ON	Inverter is not working	Call Wagan Tech Support
12 volt DC outlets switch on and off	DC Outlet is overloaded	Reduce DC load.
Television interference	Picture breaking up (static)	Place the Solar e Power Cube as far as possible from the TV, the antenna and the coaxial cable
		TV station may be out of range
Static/noise interference in audio system	Sound system has weak alternating current shielding	Do not use Inverter with low quality audio AC filtering system
		Replace audio system with high quality noise filtering
Run time is less than expected	Solar e Power Cube is not fully charged	Charge using the AC Charging Adapter.
	Product power consumption is higher than expected	Check the power or “wattage” rating and compare with the tables in Battery Operating Times section of this manual
Charging light is OFF when AC Charging Adapter is connected	No AC power at wall socket	Ensure power is available at the wall socket

Problem	Possible Cause	Solution
DC Charging Adapter does not work	Blown fuse	Check for and replace blown fuse in plug.

RECYCLING/DISPOSAL

The Solar e Power Cube contains materials that are prohibited from being placed in landfills and require recycling. These include lead-acid batteries, solar panels and some components in the Inverter. Contact local authorities for disposal/recycling instructions.

SPECIFICATIONS

Specifications are subject to change without notice.

Solar e Power Cube Shipping Specifications

Dimensions (solar panels retracted/folded closed)	20.9 × 20.9 × 14.7 in. (53 × 53 × 37 cm)
Weight	116.6 lbs (53 kg)
Solar e Power Cube warranty—see warranty statement at rear of manual	2 Years

12 Volt DC Battery and Outlets

Internal battery type	Hybrid sealed lead-acid AGM with GEL
Internal battery voltage (nominal)	12V
Internal battery capacity	100 Ah
Maximum load current through 12 volt DC Accessory Outlet (continuous)	15A
DC Accessory Outlet circuit breaker rating (internal, automatic reset)	15A
USB max output current	2.0A

Inverter

	Item No. 2547	Item No. 2547-7
AC output voltage (nominal)	115V	220V
AC output frequency	60 Hz ± 4 Hz	50 Hz ± 4 Hz
Maximum continuous AC output power	1500W (10 min. without extra batteries)	
Momentary AC surge power	3600W	
AC output waveform	Modified sine wave	
Battery drain with no load/outlets on	Less than 0.5A	
Operating/storage temperature	32–104 °F (0–40 °C)	
Low battery alarm trigger (nominal)	10.5 V ± 0.5V	
Low battery shutdown (nominal)	9.5 V ± 0.5V	

AC Charging Adapter

AC input voltage range	90–230V AC
AC input frequency	47–63 Hz
DC output voltage	For 12 volt batteries
DC output current charge current maximum	5.0 amps
AC Charging Adapter Indicator LED (red/green)	Red—Charging Green—Charging Complete/Float Charge
Output connector	DC plug (automotive)

DC Charging Adapter

DC cable length	100 cm (39 in.)
DC internal replaceable fuse	15A

Solar Panels and Solar Charge Controller

Active panel materials (5 × 16 watts)	Monocrystalline
Voltage output range	16–22 volts
Panel wattage maximum	80 watts
Panel efficiency	17%
Internal Solar Controller maximum panel wattage	300W
Controller max panel current	20A

WAGAN CORP. LIMITED WARRANTY

The WAGAN Corp. warranty is limited to products sold only in the United States.

All Wagan Tech products must be registered within (30) days of purchase to activate its warranty. To register your product, please visit http://tinyurl.com/waganwarranty. Be sure to keep the original receipt as it will be required when returning a product under the warranty.

Warranty Duration: This product is warranted to the original purchaser for a period of two (2) years from the original purchase date, to be free of defects in material and workmanship. WAGAN Corporation disclaims any liability for consequential damages. In no event will WAGAN Corporation be responsible for any amount of damages beyond the amount paid for the product at retail.

Warranty Performance: During the above two (2) year warranty period, a product with a defect will be replaced with a comparable model when the product is returned to WAGAN Corporation with an original store receipt. The replacement product will be in warranty for the balance of the original two (2) year warranty period.

To return a defective item, please contact WAGAN Corporation at (800) 231-5806 to obtain a Returned Merchandise Authorization number (RMA#), and return instructions. Each item returned will require a separate RMA#. After you have received the RMA# and the return instructions from WAGAN Corporation, please follow the instructions and send the item with PREPAID SHIPPING, along with all of the required documentation, a complete explanation of the problem, your name, address and daytime phone number. WAGAN Corporation will, at its option, replace or repair the defective part.

A Returned Merchandise Authorization number (RMA#) is REQUIRED when sending in any defective item. WAGAN Corporation is not responsible for any item(s) returned without an official Returned Merchandise Authorization number. The item(s) must be returned with prepaid shipping. WAGAN Corporation is not responsible for any shipping charges incurred in returning the item(s) back to the company for repair or replacement. This warranty is void if the product has been damaged by accident, in shipment, unreasonable use, misuse, neglect, improper service, commercial use, repairs by unauthorized personnel or other causes not arising out of defects in materials or workmanship. This warranty does not extend to any units which have been used in violation of written instructions furnished.

Warranty Disclaimers: This warranty is in lieu of all warranties expressed or implied and no representative or person is authorized to assume any other liability in connection with the sale of our products. There shall be no claims for defects or failure of performance or product failure under any theory of tort, contract or commercial law including, but not limited to negligence, gross negligence, strict liability, breach of warranty and breach of contract.