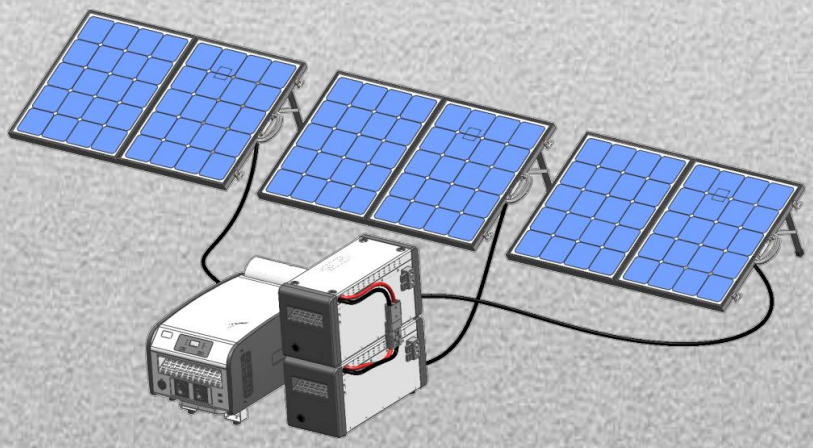
Nature POWER™

Solar Generator 1800

USER MANUAL

ENJOY THE FREEDOM OF USING SOLAR POWER



For safe and optimum performance, the Solar Generator 1800 must be used properly. Carefully read and follow all instructions and guidelines in this manual and pay special attention to the CAUTION and WARNING statements.

PLEASE KEEP THIS MANUAL FOR FUTURE REFERENCE

Note:
Because the unit contains a large battery capacity, upon receiving it, immediately charge the unit for more than 24 hours. To guarantee maximum device performance and life span, if the unit is not connected continuously to utility power or not connected to the solar panel, it is recommended to charge the unit after each use and once every 90 days.

Disclaimer
While every precaution has been taken to ensure the accuracy of the contents of this guide, Solutions From Science assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

Important
Please be sure to read the entire manual before using your Solar Generator 1800. Misuse may result in damage to the unit and/or cause harm or serious injury. Please read the manual in its entirety before using the unit and save the manual for future reference.

IMPORTANT SAFETY INFORMATION

This section contains important safety information for the Solar Generator 1800.Each time, before using read all instructions and cautionary markings on before using, or provided with, the inverter/charger, the batteries, and all appropriate sections of this guide. The Solar Generator 1800 contains no user-serviceable parts. See Warranty section for how to handle product issues.

FIRE AND/OR CHEMICAL BURN HAZARD

- Do not cover or obstruct any air vent openings and/or install in a zero-clearance compartment.
- Do not use the Solar Generator 1800, if the unit is visibly leaking some type of liquid. It is possible that the internal battery has been damaged and battery acid may have spilled.

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN DEATH OR SERIOUS INJURY

- When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
- Wear eye protection and gloves when working with batteries.
- Avoid touching your eyes while using this unit.
- Keep fresh water and soap on hand in the event battery acid comes in contact with eyes. If this occurs, cleanse right away with soap and water for a minimum of 15 minutes and seek medical attention.
- Batteries may produce explosive gases. DO NOT smoke or have an open spark or fire near the system.
- Keep unit away from moist or damp areas.
- Avoid dropping any metal tool or object on the battery terminals. Doing so could create a spark or short circuit which goes through the battery or another electrical tool that may create an explosion.

WARNING: Shock Hazard. Keep away from children!

- Avoid moisture. Never expose unit to water.
- Unit provides 120VAC from inverter or by pass utility power, treat the output socket the same as regular wall AC sockets at home.

WARNING: Explosion hazard!

- **DO NOT** use the in the vicinity of flammable fumes or gases (Such as propane tanks or large engines).
- **AVOID** covering the ventilation openings.
- Always operate unit in an open area.
- Prolonged contact to high heat or freezing temperatures will decrease the working life of the unit. Unit exposure to these elements may lead to cracking and decreased capacity of the internal battery.

FCC RULES
This Class B device complies with Part 15 of the FCC rules and all requirements of the Canadian Interference Causing Equipment regulations. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CONTENTS

1. INTRODUCTION

Thank you for purchasing the Solar Generator 1800. With our state of the art, easy to use design, this product will offer you reliable service providing a solar-powered rechargeable power source for your home, cabin, or campsite. With its highly technical design and comprehensive features, the Solar Generator 1800 will provide you with a simple yet effective user experience as you learn to generate your own power.
The unit can run many AC and DC-powered appliances whenever you need power. Add-on battery pods allow its battery capacity to be expanded for providing even longer run times, and its internal automatic transfer switch means that you can switch seamlessly from household utility power to the power you generate from the sun. This manual will explain how to use this unit safely and effectively. Please read and follow these instructions and precautions carefully.

2. GUIDELINES FOR USE

LIMITATIONS ON USE
Do not use in connection with life support systems or other medical equipment or devices.

IMPORTANT:
The Solar Generator 1800 is not suitable for use with certain products and loads which require more current than the unit can provide. It has a peak-power output of 1800 watts maximum and a continuous-load output wattage of 1440 watts when supplying backup power from its batteries. This limit applies to the total of all items plugged into the product. This output wattage is not sufficient to run products designed to produce large amounts of heat, including space heaters and pellet stove igniters or air conditioners.

3. PRECAUTION FOR USING RECHARGEABLE APPLIANCES

To comply with the published safety standards, the following must be observed when using this UPS (Uninterruptable Power Supply).

CAUTION: EQUIPMENT DAMAGE

- **DO NOT** connect an AC power source to the 120 VAC outlets.
- **DO NOT** connect the unit's AC power cord to its 120 VAC outlets.

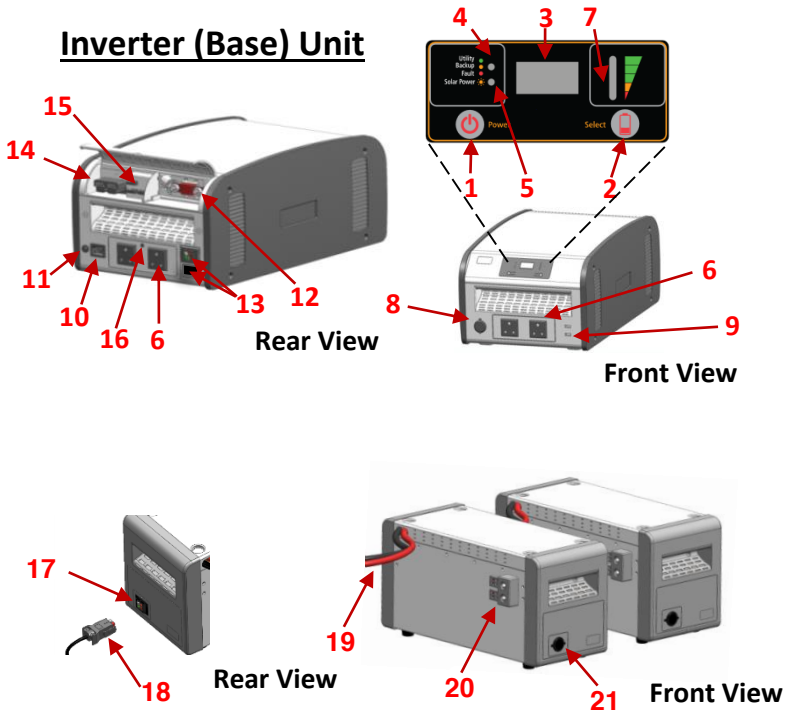
BATTERY RECYCLING
Because the internal battery contains lead, which can be hazardous if exposed to the environment, the battery should be recycled or safely disposed of at your local recycling depot. Do not dispose of the battery with common household waste. Please ask your local authorities about recycling services that are available in your area.

4. PRODUCT DESCRIPTION

The Solar Generator 1800 system includes the items list below .

- **Solar Generator 1800 BASE UNIT** **(1)**
- **EXTENSION** **(1)**
- **BASE UNIT CARRIER** **(1)**
- **USER MANUAL** **(1)**

5. PRODUCT FEATURES



Feature	*Description*	*Feature*	*Description*
1	**Power Button** turns Solar Generator 1800 on and off when utility power is not available. • Press for about a second until a beep sound occur, unit is **turned on**.	14	**Extension Battery-box Socket** allows you to connect additional Battery-box in parallel and extend running time.
2	**Select Button** displays battery level when button is pressed and held	15	**One 15Amp Fuse for Solar Power** protects when solar power is in overload conditions.
3	**LED Display** indicates status . • Display flashes "CHG", means unit battery is charging by solar power. • Display "FUL", means unit battery is fully charged.	16	**AC Output LED** illuminates blue when AC power is available.
4	**Utility/Backup/Fault LED** indicates unit running mode • LED illuminates red when unit has a problem. • LED illuminates amber when unit is running on back-up mode (Backup Power). • LED illuminates green when unit is running on utility power (AC Power).	17	**Solar Power Socket** connects to solar panel to charge battery.
5	**Solar Power LED** flashes in green when solar power is available and charges battery. It stays solid green when battery is full.	18	**Solar Panel Cable Connector (Main Unit/Extension Battery pod End)** connects solar panel from Main Unit or Extension Battery-box
6	**Six 120V AC Outlets** (two in the front and two in the rear) for powering electric devices that draw a maximum total of 1800 watts (1440 watts continuous). All outlets are surge protected and backed up by the internal battery.	19	**Battery-box cable** connects Battery-box to Main Unit
7	**Battery Level LED** displays battery level in five stages.	20	**Cable Connector Protector** holds the cable and gives protection on cable connector (avoid from short circuit risk) when Battery-box is unused.
8	**One 12V Cigarette Lighter Outlet** for powering DC devices.	21	**One 12V Cigarette Lighter Outlet** for powering DC devices.
9	**Two USB Outlets** for powering/charging 5VDC digital devices (e.g. cell phone, pad, camera & etc.)		
10	**AC Input Port**s for recharging battery by utility power.		
11	**15A Circuit Breaker** gives protection on all outlets when your connected appliances cause an overload conditions.		
12	**250Amp External Battery Fuse** protects when short circuit happens on the extension battery pod socket.		
13	**Solar and Wind Generator Power Sockets** connects to solar panel and/or wind generator to charge battery.		

6. INSTALLATION / SET-UP

WARNING: FAILURE TO FOLLOW THESE INSTRUCTIONS CAN DAMAGE THE UNIT.
WARNING: SHOCK HAZARD
If the input plug is connected and utility power is present, the outlets will be energized. The front panel ON/OFF button will not turn these outlets off.

Before beginning your Installation, please consider the following:
The base unit should be used or stored in an indoor area with environmental temperature between 32° to 104°F (0° to 40°C) where it is close to an AC wall outlet for easily accessibility. Please make sure the power cord will be plugged into a grounded AC wall outlet for safety, the power cord is 6 feet long or less. Please keep the base unit away from direct sunlight, heat, moisture or conductive contaminants. The solar panel should be placed outdoors where the best access to sunlight occurs.

When placing the unit, allow a minimum of three inches of space around the unit for optimal ventilation.
CHARGE THE BATTERY IMMEDIATELY UPON PURCHASING THIS PRODUCT.
To ensure optimum battery run time and life expectancy, leave the unit continuously plugged into utility AC power and/or leave solar panel plugged into the unit to keep the battery charged.

MAIN UNIT INSTALLATION

To install the unit, plug one end of the AC input power cord to the main unit and the other end directly into a wall outlet and unit is ready to use.

Follow instructions below to test the unit: (If you have an extra battery Pod/s attach it/them to the main unit before you start the conditioning process.)

The unit will be automatically turned on when the AC power cord is plugged into the wall outlet. The "**Utility/Backup/Fault LED**" and "**LED Display**" light turn on indicating the unit is ON. The unit is functioning in standby mode and is ready to provide backup power. AC output is now being provided directly from utility power.

The Digital Read out should flash CHG- this indicates the unit is charging. Now leave the unit charging for three days. At some point the digital display will stop flashing CHG and will indicate "FUL". Ignore this indication and just leave the unit plugged in for the three day period.

At the end of the Three days unplug the generator from the outlet and connect a load to the generator. 100-300 watts. Let the generator power the load until it shuts itself off or begins to beep. NOTE: when you unplug the unit from the wall outlet it automatically switches to battery mode.

Now remove the load and recharge the Battery from the AC outlet until the display reads "FUL" Next run the batteries down again until the unit shuts itself off or begins to beep.

Do this 3-5 times. (You only need to leave the unit plugged in for 3 days one time, after that it is ready once the unit reads "FUL")

Now the unit is successfully installed, functioning properly and ready for normal use.

PV SOLAR PANEL INSTALLATION

WARNING: SHOCK, FIRE AND ENERGY HAZARDS.
Make sure the solar panel is covered with an opaque sheet or facing the ground before connecting or disconnecting the solar panel cable to the base unit. All wiring must be done in accordance with applicable electrical wiring codes.

CONNECTING THE BASE UNIT TO SOLAR PANEL:

WARNING: SHOCK, FIRE AND ENERGY HAZARDS.
The Solar input port is rated at 20V 8A and is designed to be used with the solar panel. be sure the solar panel is designed for a 12V battery system and with a maximum open circuit voltage more than 13VDC and less than 25VDC. Please refer to the specifications label on the solar panel before connecting. Do not connect a PV source capable of delivering more than 8 amps. Connecting a solar panel with a higher voltage or current rating will permanently damage the unit and may cause fire and energy hazard.

CAUTION: REVERSE POLARITY.
Improper connections (reversing the wire connection on the solar panel connection box) will cause the unit to malfunction and may permanently damage the unit. Damage caused by a reverse polarity connection is not covered by the warranty.

- Plug in the solar panel cord plug to the solar input port located at the back of the unit. Please note the polarity of the connector. (Don't force the connector; it will only go in one way. It will 'click' into place)
- Remove the opaque sheet or flip the solar panel up with the solar cell surfaces facing upwards. Adjust the mounting frame of the solar panel to have the solar cell surface angled for the proper season and point the panel due south. When sunlight is available, the solar charge indicator should automatically turn on and the "**Solar Power**" LED should either flash or remain on solid depending on the battery status.

NOTE: It is recommended to always charge the internal battery to a 100% state-of-charge, as shown by a steady green on the "**Solar Power**" LED. (The LED flashes while the solar panel is charging the battery.)

DISCONNECT SOLAR PANEL FROM UNIT:

- Cover the solar panel with an opaque sheet or flip the solar panel with the solar cells facing down on a flat surface to minimize the output voltage to zero volts.
- Verify the Solar charge indicator is off.
- Disconnect the solar cable connector from the solar input port of the unit. Gently squeeze the locking tabs on the sides of the plug while pulling it out to release the plug.

GENERAL NOTES ON SOLAR PANEL USE AND MAINTENANCE

- **Keep the solar panel clean.** An accumulation of dirt, dust, or mildew will cause poor performance as the dirt will block the light from the panel. Use only mild soap and water to clean the panel. Caustic or abrasive cleaners or solvents will damage the panel's surface. Do not use any glass cleaners with ammonia as these will also damage the panel.

- **You can maximize the performance of the solar panel** by "following" the sun as it moves across the sky. Re-aim the panel toward the sun periodically during the day to keep the light hitting the panel as close as possible at a 90 degree angle to the panel's surface. Also watch the panel to make sure that it stays out of the shade of trees, or other cast shadows, as from buildings or other nearby landscape items.

- **Do not worry about leaving the panel outside during inclement weather**. The panel is designed to withstand rain, snow, sleet, and hail (less than 1" in dia.). The panel can also endure summer heat and winter cold temperatures. As long as the panel is anchored against the wind it will survive most normally experienced weather conditions. This applies to the solar panel only, the generator/battery pack must be kept clean and dry at all times.

WIND GENERATOR INSTALLATION

WARNING: SHOCK, FIRE AND ENERGY HAZARDS.
Make sure the wind generator output is turned off before connecting or disconnecting the cable to the base unit. All wiring must be done in accordance with applicable electrical wiring codes. Turn on the wind generator output only after plugging the cable into the base unit.

CONNECTING THE BASE UNIT TO A WIND GENERATOR:

WARNING: SHOCK, FIRE AND ENERGY HAZARDS.
The wind generator input is rated 15V at 25A and is designed to be used with a 300 watt maximum wind generator. The wind generator must have its own charge controller and output kill (ON/OFF) switch. The charge controller must be rated for 300 watts and 12 VDC nominal battery charging. NOTE: If you choose to connect a wind generator you must do so with an Anderson Power Pole connector set up as outlined below. You will need to purchase the parts and assemble the connector/cord for plugging into the base unit.

CAUTION: REVERSE POLARITY.
Improper connections (reversing the wire connection on the wind generator connection) will cause the unit to malfunction and may permanently damage the unit. Damage caused by a reverse polarity connection is not covered by the warranty.

- Plug in the wind generator cord plug to the wind generator input port located at the back of the unit. Please note the polarity of the connector. (Don't force the connector; it will only go in one way. It will 'click' into place)
- The wind generator output should be turned ON only after connecting the cable plug to the unit.

NOTE: The Anderson Power Connector plug color coding for the Wind Generator is as follows:

- Red - POSITIVE (+)
- White - NEGATIVE (-)
- Green - Ground (⏚) (GND)
- Blank - Anderson Spacer (long)

Information on Anderson Power Pole Connectors can be found here (Download the pdf file):
http://www.andersonpower.com/litlib/files.html/download/62

7. INSTALLING ADDITIONAL BATTERY PODS: (OPTIONAL)

Connecting the unit to one, or up to three, battery pods will double, triple, or quadruple the unit run time. Follow the details in "**Solar Generator 1800 BATTERY-POD INSTALLATION GUIDE**" provided with the battery pod for battery pod installation. See also below a brief guideline to access the built in auxiliary DC input port on the main unit and how the extension battery pod is connected.

PLEASE BE SURE THE AC POWER CORD IS UNPLUGGED AND THE UNIT IS TURNED OFF.

- Remove the top back panel by unscrewing the screw located on the middle of the panel. The auxiliary port is located at the left side of the compartment.
- Place the optional battery pod on the right hand side of the main unit.
- Take out the auxiliary DC input plug from the battery pod and connect it to the main unit output port.
- You may connect an additional 100W Solar panel to the battery pod by connecting the solar panel to the solar input connector at the back of the battery pod following the same procedure outlined above.
- The unit is now ready to provide power with increased the run times.

TIPS: The extension battery pod is **designed to be stackable**. Additional battery pods can be connected to the first battery pod. Using the above procedure, multiple battery pods may be connected up to 3 battery pods total.

NOTE: To guarantee maximum device performance and life span if the battery pod is not connected continuously to utility power or not connected to the solar panel, **IT SHOULD BE CHARGED AFTER EACH USE AND AT LEAST ONCE EVERY 90 DAYS.**

8. OPERATION

OPERATING THE MAIN UNIT

OPERATING MODE (MAIN UNIT)	STATUS LED INDICATIONS	ALARM STATUS	ALARM STOPS SOUNDING WHEN…
NORMAL OPERATION: Utility power is available and unit is turned on. The internal battery is fully charged.	"Utility/Backup Power/ Fault" LED is solid green. Screen shows "FUL."	None	Not applicable
RECHARGING INTERNAL BATTERY: Unit is recharging its internal battery after utility power has been restored. Internal fan is running.	"Utility/Backup Power/ Fault" LED is green. Screen shows "CHG" and shows "FUL" when internal battery is full.	No sound	Not applicable. Screen shows "FUL" when unit is completely charged.
BACKUP POWER: Utility power is not available. Unit supplies power from its internal battery.	"Utility/Backup Power/ Fault" LED flashes once a second and stays amber after 7 seconds	One beep when the power outage occurs.	Utility power becomes available; unit resumes normal operation or when it is turned off.
SOLAR CHARGING: Unit is connected to PV solar panel and charging internal battery.	"Solar Power" LED flashes once a second and stays solid green when internal battery is fully charged.	None	Not applicable
LOW BATTERY WARNING: During backup power operation, the internal battery is close to being completely discharged.	Screen shows Error code F_05	Beeps once every 2 seconds.	Utility power becomes available; unit resumes normal operation or when it is turned off.
OVERLOAD WARNING: During backup power operation an AC outlet overload was detected.	"Utility/Backup Power/ Fault" LED Stays RED. Screen shows Error code F_06.	Beeps every 2 seconds.	When load becomes normal, unit resumes normal operation or when it is turned off.
OVERLOAD SHUTDOWN: During backup power operation an AC outlet overload was detected.	"Utility/Backup Power/ Fault" LED Stays RED. Screen shows Error code F_03.	One beep per second. Unit shuts down after 10 seconds.	Not applicable
OVER-VOLTAGE PROTECTION	"Utility/Backup Power/ Fault" LED stays RED, Screen shows error code F_02.	One beep per second. Unit shuts down after 10 seconds.	Not applicable. Unit starts recharging the internal battery when utility power is restored. Turn on the unit to restore normal operation.
UNDER-VOLTAGE SHUTDOWN: During backup power operation the battery power has been completely exhausted. No power is available at the AC outlets.	"Utility/Backup Power/ Fault" LED stays RED. Screen shows error code F_01.	One beep per second. Unit shuts down after 10 seconds.	Not applicable. Unit starts recharging the internal battery when utility or Solar power is restored. Turn on the unit to restore normal operation.
OVER-TEMPERATURE WARNING: During backup power operation, the unit is close to shutting down to protect its internal circuitry from high temperatures.	"Utility/Backup Power/ Fault" LED stays RED. Screen shows error code F_07.	Beeps once every 2 seconds.	Better ventilation is provided to the unit, or the unit enters over-temperature shutdown, or the unit is turned off.
OVER-TEMPERATURE SHUTDOWN: Unit has shut down to protect its internal circuitry from high temperatures.	"Utility/Backup Power/ Fault" LED stays RED. Screen shows error code F_04.	One beep per second.	The unit is turned off or when the unit shuts down.

9. OPERATING THE PV SOLAR INPUT

The main unit comes with a solar input port and a built-in solar charge controller that allows a solar panel to charge the internal battery.

The charge controller is a fully automatic device that will initiate the charge cycle when solar power is available. Please note that the charge controller is designed to be used with the 100W solar panel. Connecting to other solar panels may damage the unit or over charge the battery. If sufficient charge capacity is not available from the solar source, it is recommended to use the internal 5A charger to complete the battery charging process through the AC utility. The internal 5A charger works automatically any time the unit is connected to 120 VAC utility power.

10. UNDERSTANDING THE ERROR CODES

ERROR CODE	CONDITION	CORRECTIVE ACTION
F_1	Inverter has sensed input under voltage and has shutdown	Recharge battery immediately and restart unit
F_2	Inverter has sensed input over voltage and has shutdown	Check battery voltage or if any external charger is connected to the battery pod. Correct input and restart unit.
F_3	Inverter output has sensed overload or short circuit and was shutdown	Check load connected to the output. Reduce load and restart the unit
F_4	Inverter has sensed internal temperature high and has shutdown	Turn unit off and wait for 15 minutes before restarting. Check if any object has blocked the air flow of the unit
F_5	Inverter has sensed low voltage input and warning occurs	Recharge battery as unit will shut down shortly
F_6	Inverter has sensed output load is high and overload shutdown is near	Check load connected to the output. Reduce load.
F_7	Inverter has sensed internal temperature high and is close to thermal shutdown limit	Reduce load and check if any ventilation of the unit is blocked.
F_11	Transfer relay has sensed high temperature and shutdown	Check load connected to the output. Reduce load and check if any ventilation of the unit is blocked

11. ESTIMATED RUN TIMES FOR VARIOUS LOADS

The following run times are from the base unit's 80AH battery on specific loads used for testing. Actual run times may vary.

LOAD	CONSUMPTION	ESTIMATE RUN TIME
Cordless Phone	5W	140hrs
Home Alarm System	5W	140hrs
Clock/Radio	8W	84hrs
Table Lamp	40W/60W	16hrs/ 11hrs
Freezer (8.8 cu. ft.)	80W	8.5 hrs
20" LCD TV	100W	6.5hrs
Refrigerator (18 cu. ft.)	120W	5hrs
Sump Pump (1/2 hp)	300W	1.5 hrs
Microwave (mid-size)	1000W	45 mins
Coffee Maker	1200W	25 min

TIPS: MAXIMIZE THE USAGE OF YOUR Solar Generator 1800

During times of power outage, here are some tips to maximize your run times for key back-up power applications:

- Do not leave appliances on when not in use because they will drain the internal battery.
- For computer use, use laptop, or desktop computer with LCD monitor instead of desktop computers with a CRT monitor.
- Use small TVs instead of big screen TVs.
- Use small desk lamps (25 to 40 W) instead of high-wattage lamps.

12. BATTERY REPLACEMENT

The unit contains an 80AH battery. A qualified battery/electronic technician is required to replace the battery. To replace the battery, please contact customer service for details.

13. TROUBLESHOOTING

To trouble shoot the unit, please note the error code display on the main unit and review “Understanding the Error Codes”

PROBLEM	SYMPTOM	SOLUTION
Insufficient run- time	Battery is not fully charged	Charge battery by leaving the unit plugged into the utility for more than 24 hrs to fully charge the battery or leave the solar panel plugged into the battery pod for more than 72 hrs
	Battery is near the end of it’s life	Replace battery or battery pod/s
Solar Charger indicator is not ON when solar panel is connected	Solar panel cannot supply sufficient power to start the solar charger and charge the battery	Check location and direction of solar panel
	Wrong wire connection on solar panel junction box	Verify solar panel junction box connection
Unit has no output	Unit is off	Turn unit on
	Unit has shut down due to various potential conditions	Check utility, battery voltage, and unit settings. See Unit Operation section

14. SPECIFICATIONS

NOTE: Specifications are subject to change without notice.

INVERTER SPECIFICATION:	
Output Current/Power:	12A/1440W continuous 15A/1800W maximum
Surge Power:	2880W peak
Output Voltage:	120 VAC/ 60 Hz
Output Waveform:	Pure Sine Wave
Peak Efficiency:	90%
No Load Battery Draw (unit in standby):	< 3W
DC Input Voltage Operating Range:	10.5 – 15.5 VDC

INTERNAL AC CHARGER SPECIFICATION:	
Output Current:	5 ADC
Output Voltage (Absorption/Float):	14.8/13.5 VDC
Recharge Voltage:	12.6 VDC
Efficiency:	80%
Charger Type:	3 stages (bulk/absorption/float)
Rated AC Input Voltage:	120VAC

SOLAR PANEL CHARGER SPECIFICATION:	
Output Current:	8A maximum
Output Voltage:	14.8/13.5 VDC
Recharge Voltage:	12.6 VDC
Input DC Voltage:	13 - 25 VDC maximum
Efficiency:	>95%
Charger Type:	PWM control

BATTERY SPECIFICATION:	
Battery Capacity:	12V, 60/80Ah
Battery Type:	Sealed Lead Acid (Deep cycle)

REGULATORY APPROVAL:
ETL, FCC

STANDARDS:	
Safety	Conforms to UL STD.1778 CERTIFIED TO CSA STD.C22.2 NO.107.3-05
FCC	Class B according to FCC part15B and ANSI C63.4: 2009

GENERAL SPECIFICATION:	
Best Operating Temperature:	Less than 77°F (25°C)
Dimension	554 x 307 x 243mm
Weight	34.8kg

15. OPTIONS FOR EXPANSION & ACCESSORIES

This Solar Generator 1800 Kit is a modular design. Battery capacity can easily be extended with multiple standalone battery pods through a pre-wired built-in internal connector located at the back of the unit. Additional solar panels can be purchased to improve battery charging time (1 for each additional battery pod).

EXTEND UNIT RUN TIME WITH SOLUTION FROM Nature Power:

- Purchase Solution From Nature power Solar Generator 1800's 12V 80Ah battery pods with 8A solar input port

REDUCE BATTERY CHARGING TIME WITH Nature Power SOLAR SOLUTION:

- Purchase an extra 100W Solar panel (one for each battery pod)

USE YOUR Solar Generator 1800 AS A JUMP START POWER PACK BY BUYING JUMP START CABLE ACCESSORY:

- 10 feet customized jump start cable (check with Nature Power availability - **800-588-0590**)

EXCLUDED FROM COVERAGE UNDER THIS WARRANTY:

This unit is not intended for commercial use. This warranty does not apply to damage caused by misuse or incorrect installation/connection. Misuse includes wiring or connecting to improper polarity power sources and customer modifications.

RETURN/REPAIR POLICY:

If you are experiencing any problems with your unit, please contact NATURE POWER Customer Service at **800-588-0590** before returning the product. After speaking to a customer service representative, if products are deemed non-working or malfunctioning, a return materials authorization (RMA) will be issued. The product may be returned to Nature Power for free replacement or repair within 90 days. **Products may not be returned without an RMA**.

If the unit is repaired, new or reconditioned replacement parts may be used, at Nature Power's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under these terms for the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items.

LIMITATIONS:

This warranty does not cover accessories, such as adapters, damage or defects resulting from normal wear and tear (including chips, scratches, abrasions, discoloration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, fire and flood.

If your problem is not covered by his warranty, contact our Customer Service Department at **800-588-0590** for general information if applicable.

PLEASE NOTE: TWO YEAR EXTENDED WARRANTY

A 2 year extended warranty may be purchased directly from Nature Power

Please call Nature Power for details: **800-588-0590**

16. UNDERSTANDING SOLAR ELECTRIC POWER

Understanding the specifications and operational characteristics of your solar powered electrical back-up system will help you obtain the maximum utilization and enjoyment from it. All solar electric power systems depend on batteries to supply the bulk of the power delivered to the user. The primary function of the solar panels is to charge the batteries. While some small electrical loads may be supplied directly from a solar panel this is usually not practical.

Solar panels do a very efficient job of converting sunlight directly into electrical energy. The caveat is that as the intensity of light falling on the panel changes so does the electrical voltage and current supplied by the panel. Most electrical appliances need a reasonably well regulated voltage and current supply to function correctly. In order to provide this an electronic regulation device known as a solar controller is used in conjunction with batteries. The batteries serve to provide a constant source of electrical power when the level of light falling on the solar panels is too low to provide sufficient power. The solar controller acts like an intelligent battery charger supplying solar energy to the batteries when it is available to keep them charged up. The solar controller also monitors the state of charge on the batteries to keep them from becoming over charged.

Most modern appliances run on AC (alternating current) electric power. Unfortunately, batteries, which are capable of storing electrical energy, cannot supply AC power. They are only capable of supplying DC (direct current) electric power. Another electronic device, called an inverter, is used to convert the DC power from the batteries into AC power to run the AC appliances.

So at night or any other time that there is insufficient light for the solar panels to produce power the batteries continue to supply power until they are totally drained or the light returns and the solar panels start to recharge the batteries. Since the usable power is always provided by the batteries it is possible to use the batteries power faster than it is being replenished by the solar panels. In this case the batteries will eventually become drained even though the solar panels are trying to charge them.

In simpler terms, the battery acts like a barrel of water with a spigot at the bottom. The barrel can continue to supply water out of the spigot as long as water is being poured into the top of the barrel at least as fast as it is being drained out of the spigot. But, if the spigot is opened up to the point that it is draining water out faster than it is being poured into the top the barrel will eventually become empty.

So while a solar electric system uses an endless source of energy, it can only access that energy at a rate fixed by the size of the solar panels. It can also only access that energy during the hours of the day that sunlight actually falls on the solar panels. However, the batteries can store a fixed amount of the energy for use while the panels have no access to sunlight. The size (Amp-Hour rating) of the battery determines the amount of energy that can be stored.

Thus, any user of a solar electric power supply system must experiment a little to determine the balance between how much power he can use while the system is charging from the solar panels and how much power must be stored for use during the evening and night time hours to meet his personal needs.

The power rating of any solar electric system tells you the maximum amount of power the system can supply at any given instant in time. The size of the battery/batteries determines how long the system can supply that amount of power. The owner/user should study the systems “runtime charts” to understand how long the system should be able to supply any given appliance or combination of appliances. The size and type of chemistry of the battery in conjunction with the size of the solar panel array determines how fast the battery can be charged by the sun alone. A system that is intended to be portable, such as the **Solar Generator 1800** is limited by the size and weight of equipment that can be easily handled. More powerful solar electric systems are usually stationary installations due to the necessary size and weight of the equipment. Whole house solar electric systems usually have battery banks that weigh hundreds, and sometimes even thousands, of pounds.

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