

Solar Freedom™ Package - Starter Kit

Grid-Interconnected Solar System with Battery Storage



Start with a Storm Outage Back-up System... Grow into Full Energy Independence!

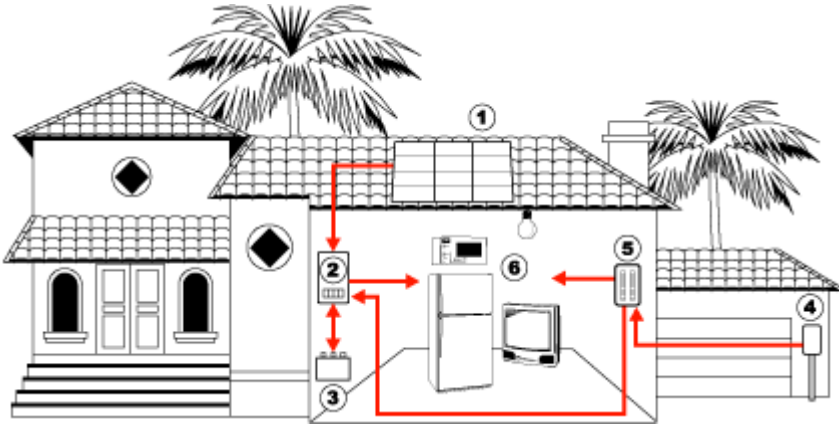
- Peace of Mind
- Energy Independence
- Environmentally Responsible

Enough sunlight hits the United States each day to provide for the entire world's electricity needs. Taking advantage of this clean, renewable and highly available resource could put Americans in control of their electrical needs. While devastating storms will continue to ravage the country, Americans could potentially avoid the electrical blackouts left in their wake.

Coming to the aid of home-owners seeking both lower monthly bills and reliable home power solutions, Solar Direct offers consumers the **Solar Freedom™ Package Starter Kit**, an All-In-One entry-level solar photovoltaic (PV) package, combining immediate power backup, regular monthly utility savings and the long-term ability to grow the home solar system into complete energy-independence.

Benefits of PV Power Systems

- Solar power systems lower your utility bills and insulate you from utility rate hikes and price volatility due to fluctuating energy prices
- Solar increases property value and home resale opportunities
- Purchase of a solar power system allows you to take advantage of available tax and financial incentives
- Solar electric systems are quiet, reliable, fossil-fuel free
- Unlike mobile power generators, avoids Greenhouse gas emissions



1. SOLAR PV PANELS convert sunlight instantly into DC electric power. With a PV (photovoltaic) system, your home will operate even during a utility power outage.

2. INVERTER converts DC power into standard AC power for use in the home, synchronizing with utility power whenever the electrical grid is distributing electricity

3. BATTERIES (included in the Inverter) provide power during a utility outage. Solar PV panels continues to re-charge batteries each day to maintain battery charge.

4. UTILITY POWER is automatically provided at night and during the day when the demand exceeds your solar electric power production. Utility meter actually spins backwards when solar power production exceeds house demand, allowing you to credit any excess electricity against future utility bills.

5. HOUSE BREAKER BOX Existing electrical panel distributes solar electricity and utility power to loads (appliances) in the house.

6. HOME APPLIANCES watt usage varies. Based on a 6 sun hours per day of sun, a Solar Freedom Starter Kit™ can supply: Refrigerator 500 watts 5 hrs, TV 150 watts .75 hr, Light Bulb 60 watts 1 hr, Radio 1 watt 10 hrs, Microwave 600 watts .25 hr

Base Product Components:

Sharp Photovoltaic Panels

A 3 panel system consisting of 550 watt-hours sufficient for running select home appliances in "survival mode".

Sharp NT-185W Module Features:

- High-power module (185W) using 125mm square single crystal silicon solar cells with 14.2% module conversion efficiency
- Photovoltaic module with bypass diode minimizes the power drop caused by shade
- Textured cell surface to reduce the reflected sunlight and BSF [Black Surface Field] structure to improve cell conversion efficiency: 17.5%

- White tempered glass, EVA resin, and a weatherproof film, plus aluminum frame for extended outdoor use
- Nominal 24VDC output, perfect for grid-connected systems
- UL Listings: UL 1703, CUL
- Sharp modules are manufactured in ISO 9001 certified facilities
- Solder-coated grid results in high fill factor performance under low light conditions
- 25 Year Warranty

PS1-3000 Inverter

Converts DC power into standard AC power for use in the home, synchronizing with utility power whenever the electrical grid is distributing electricity

- 3000VA Vented Inverter
- Battery-based Power Back-up
- MX60 Charge Controller
- True Sinewave Output
- CEC certified 91% Efficiency Inverter
- Zero AC Watts Consumed at Night
- Proven Maximum Power Point Tracking
- 16 Millisecond AC Transfer Switch
- Type 3R Rainproof Enclosure
- Multiple Anti-Islanding Safeguards
- Standard 5-year Warranty

See **PS1-3000 Inverter** complete details on page 5

- 4 Concord Batteries Model PVX2580L 305ah 12VD
- 3 PV Mounting
- 1 OPPV Breaker
- 5 A/C Load Breakers
- 1 A/C Main Breaker

How Does It Work?

The **Solar Freedom™ Starter Kit** converts sunlight into DC electricity through the use of solar panels (PV Modules). From there, the DC electricity is fed through the inverter which transforms it into utility-grade AC electricity to power your home. Sometimes, your home will require more electricity than the system provides and the excess need is filled by the utility company. However, when less electricity is required than the system is generating, the excess can be fed (or sold) back to the utility. In the event of a blackout, the **Solar Freedom™ Starter Kit** relies on its unique battery back-up to continue to provide minimal electricity to your home.

Part or the entire household load is powered via the inverter connected to the existing household circuit breaker box. Typically, heavy energy consumption devices such as air-conditioners, electric heating, electric stoves, heat pumps and electric hot water heaters are left running directly on the utility power. These devices are seen as non-critical during a utility outage due to their high instantaneous power and daily energy consumption, placing a huge burden on the system inverter and energy storage battery bank during a utility failure. In the event of a utility power outage, power will be lost to the "big", non-critical loads. At the same time, the inverter will take over supply to the "dedicated" loads, supplying with power until the utility power is restored.

What Does It Do?

The **Solar Freedom™ Starter Kit** is able to run your home in “critical mode” for approximately 3 days during a storm or other electrical outage. For example, the Solar Freedom Starter Kit can run an energy-efficient refrigerator for 24 hours/day, keeping your food fresh. It can simultaneously run a TV for 45 minutes/day and a clock radio for 10 hours, keeping your family in communication with the world. In addition, a microwave oven can be run for 15 minutes, providing your family with 2-3 hot meals.

During normal operating periods, the system will continue to provide your home with excess energy even when the electric companies get back online. This will allow you to continually keep monthly utility bills under control.

The table below demonstrates typical home appliances that can be supported by Solar Freedom™ when running the home in “power outage” survival mode. As the system is upgradeable, more solar modules (and home appliance support) can be added over time, to support up to 3000 Watts of electricity usage per day.

Example Appliance “Critical Use” Patterns Supported by the base Solar Freedom™ Starter Kit (550 Watts of solar-based electricity) *

Primary Usage Appliance	Average Watts	Usage 1 (hrs/day)	Usage 2 (hrs/day)
Standard Refrigerator	500	24 hours**	
Energy-Efficient Refrigerator (Sun Frost)	150		24 hours***
25-inch color TV	150	45 minutes	7 hours
One lamp	60	1 hour	10h hours
Clock radio	1	10 hours	10 hours
Small Microwave Oven	600	15 min	15 min

*Appliances and usage time varies; table based on 6 sun hours per day. Battery backup without the sun averages 3 days.

**Standard refrigerator use based on a reduced operating temperature during power outages; performance can be increased by making ice blocks before outage for thermal storage.

***Sun Frost super-efficient refrigerator operating under normal conditions.

Eligible for Federal Tax Incentives Program

The 2005 Federal Energy Tax Incentive Bill creates a new 30% tax credit for residential solar installations for two years that is capped at \$2000. This credit applies to all property placed in service after December 31, 2005 and before January 1, 2008. After that point, the credit reverts to the permanent 10% credit.

Eligible for State Incentives Program

Many states have additional financial incentives to be applied against solar equipment purchases. Please check your state's incentives online at www.dsireusa.com for details.

By investing in a **Solar Freedom™ Starter Kit**, you are immediately enrolled in Solar Direct's Frequent E-Buyer Award Program. Points can be applied toward additional solar PV add-on purchases as well as toward solar water heating and solar pool heating purchases. Call for details.

PS1-3000 Grid-Interactive Solar System

Product Benefits:



- Simple Installation
- High Performance
- Maintenance Free
- Ultra Reliable
- Type 3R Rainproof

Product Features:

- Battery-based Power Back-up
- True Sinewave Output
- CEC certified 91% Efficiency Inverter
- Zero AC Watts Consumed at Night
- Proven Maximum Power Point Tracking
- 16 Millisecond AC Transfer Switch
- Type 3R Rainproof
- Multiple Anti-Islanding Safeguards
- Standard 5-year Warranty

The PS1 is advanced engineering and refinement that you have come to expect from OutBack Power in a next generation grid-interactive solar electric system. The system's battery back-up is a silent and hands-off alternative to noisy and maintenance intensive generators. Designed with an emphasis on performance, the PS1 system operates similarly to standard solar inverters but with the unique benefit of uninterrupted power during utility outages.

In side-by-side "real world" testing, the PS1 system performs within 5% of the industry leading battery-less grid-tie inverter. This translates into more money savings when using net metering.

The same field proven MPPT technology found in the MX60 solar charge controller is featured in the PS1. This technology gives the system the ability to use your PV array at its peak output.

Uninterrupted AC power is provided by the system's true sinewave inverter that has an industry leading, California Energy Commission (CEC) certified, efficiency of 91% – thus guaranteeing that your household appliances run seamlessly while utilizing all available

solar power.

Your recommended AGM batteries are maintained and charged by an innovative OutBack multi-stage charging process, this valuable feature assists in providing reliable back-up power and a battery life up to 10 years.



Like every OutBack Power product, the PS1 is rugged. All components are protected within an aluminum type 3R rainproof enclosure.

An ultra-fast 16 millisecond AC transfer switch guarantees that even sensitive back-up loads, like computers, never know when a grid outage occurs.

The ETL listed system is pre-wired by OutBack engineers to ensure that the PS1 system works reliably for years to come. A standard 5-year warranty provides peace of mind and satisfies state rebate requirements.

High performance, battery back-up, and proven OutBack engineering makes the PS1 system the only choice for a premium grid interactive solar power system.

Product Specifications:

PS1-3000 Inverter Specifications

<http://shop.solardirect.com/pdf/solar-electric/inverters/ps1-inverter-specs.pdf>

PS1-3000 Wiring-Diagram

<http://shop.solardirect.com/pdf/solar-electric/inverters/ps1-inverter-specs.pdf>

©Solar Direct – 5919 21st Street East – Bradenton, FL 34203 – 800-897-6527
sales@SolarDirect.com – TheEnergySuperMarket.com