THE RV SOLAR REFERENCE GUIDE 2023

Go Power! | DOMETIC

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gopowersolar.com

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HOW SOLAR WORKS

Solar takes the sun's energy and converts it into DC battery power to charge your RV batteries. It is a battery charger that works anytime the sun is out.

Solar Panel(s)
Your battery powers your appliances and devices. Solar panels help to ensure a healthy battery charge and extend their lifespan

Cable Entry Plate
Easy, time-saving wire installation, protects cable connections and helps prevent roof leaks

Solar Controller
Protect the life of your solar battery, whether it's Lithium, AGM, or Lead Acid

Converter/Charger
Quickly charge your batteries with shore power

Battery Monitor
Monitor the health and stats of your battery and travel worry-free

Transfer Switch
Automatically switch between inverter and shore power

Power Inverter
Convert DC power to household AC power, and run your appliances or electronics

Fuse Block
Safeguard equipment with durable class-T DC rated fuse and fuse block

Battery
Batteries store DC power generated from the panels and can run RV lights and fans

DC Power (direct current)
AC Power (alternating current)
AC/Inverter Power

DID YOU KNOW?

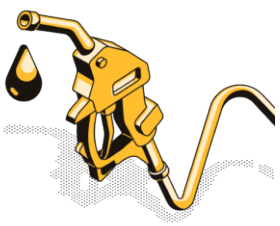
IC Series Inverter Chargers combine three essential mobile power components into one sleek package!

TRANSFER SWITCH + PURE SINE INVERTER + BATTERY CHARGER = Go Power! IC3000

But how do these components work together to power your RV's components? Read on to learn more.

1. RV SOLAR–EXPLAINED

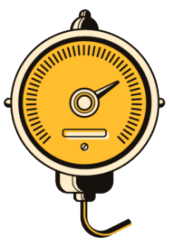
HOW IS YOUR RV SOLAR SYSTEM LIKE THE FUEL SYSTEM IN YOUR CAR?



It helps to think of your RV solar system as your car's fuel system. The RV Battery is like your car's gas tank. A typical RV battery may be rated at 100 amp hours. Those amp hours are like gallons of fuel in your gas tank. Just as you consume gasoline to run your car's engine, you use up amp hours to operate RV appliances like your water pump, refrigerator, or TV. When your battery is depleted, you need to replenish those amp hours; in this case, with energy from your solar panels.

Voltage. Think of voltage as "pump pressure". Using our auto analogy, imagine you pull your car into the gas station to refill your gas tank. If the gas pump doesn't provide enough pressure, it will not completely fill your gas tank and you won't be able to drive as far next time.

The same is true for RV solar charging. Many standard RV solar chargers don't produce enough voltage, only charging your RV battery to 13.7 volts—much less than the 14.4 volts required for a full charge. Without that complete charge, your "gas tank" won't be full. This means you won't be able to stay off-grid and run on battery power for as long as you would with full batteries. That's why Go Power! solar solutions are designed to charge to the right voltage, giving you a 100% charge—every time.



A word about wiring. Think of your RV wiring as the fuel line in your car. If the line is very small, it can't provide enough fuel to that big V8 engine, which will sputter and perhaps even stop altogether. This is the case in your RV. If you use inadequate, thin-gauge wire for your system, those wires won't carry the full amount of power to your batteries or inverter, causing them to not run your appliances properly. This can pose a safety hazard, as the wires may become too hot. Every Go Power! system uses the correct, heavy gauge wire to ensure all components and appliances receive the right amount of power.

SOLAR COMPONENTS

Your RV solar power system is made up of several key components that all work together to collect, regulate, store, and deliver power to your RV appliances. All these components must be compatible in type and capacity to ensure your solar system performs safely and optimally.

Now let's break down the individual components of our RV solar system.

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2. SOLAR PANELS

DEMYSTIFYING SOLAR PANELS

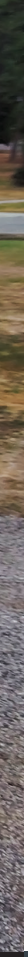
How they work. Solar panels are made up of individual solar cells that convert sunlight into energy. That energy comes in the form of direct current (DC) electricity, which is used to charge and replenish your RV's batteries. Typically, several panels are joined together, creating a 'solar array.'

What to look for. There are three common types of solar panels: amorphous, monocrystalline, and polycrystalline.

While **amorphous panels** are the least expensive, they are the least efficient and take up the most room. They can also lose up to 30 percent of the power-generating capabilities in their first year—they actually degrade when exposed to sunlight!

Polycrystalline panels take up roughly half the space to produce the same power as their amorphous counterparts, however, they can vary widely in quality. Look for panels with the highest rated wattage for their size. A smaller footprint means a more efficient panel.

While **monocrystalline panels** are also available with different grades of cells, they are almost always more efficient than poly panels. ***They also typically last longer, making them the wallet-friendly choice.***



RIGID VERSUS FLEXIBLE PANELS

Rigid panels are more commonly used than flexible panels. Rigid panels are made with tempered glass, are very durable, and typically come with much longer warranty periods.

Flexible panels are usually reserved for specialty applications — when the panels need to be molded to curved surfaces, or when where there are height/weight constraints. While flex panels may be up to 80 percent lighter than rigid panels, they are much more susceptible to damage.

For cost, durability, and warranty length, it's tough to beat the value of rigid glass panels.

BUYING TIPS

Don't be tempted by cheap panels. They are usually made with low-quality, or cut cells—while they may be cheaper, they're far less efficient. Full, complete solar cells perform better, last longer, and are worth the additional cost.

Watch out for manufacturer claims of wattage output. The best manufacturers will provide a minimum output for their panels, as opposed to maximum output. Always ask your seller to document their panel output range (including a plus/minus percent).

PORTABLE SOLAR PANELS

PARK IN THE SHADE. CHARGE IN THE SUN

You may have an RV with solar panels installed on the roof. What happens if the space you want to park in is shady? Charging your panels in this situation is not optimal. Luckily, there are powerful, portable solar panels that can alleviate this pain point.

They offer the ability to place a solar panel in the sun without worrying about shade or sun. Extension cables (up to 30ft) let you move the panel easily with the sun.

Portable Solar Kits (PSK) are generally folding solar modules. They are ideal for those who don't want to permanently mount solar to a rooftop or want to supplement a roof top system.

Most PSK systems come with an Anderson-style battery charging connector ro allow you to quickly interchange the charging accessory to best suite your needs – from maintaining your RV or trailer battery while on the road to trickle charging your car, ATV or boat battery.

Adjustable folding legs also allow you to maximize solar exposure and for compact easy storage. Because of these features, they are a great supplemental solar kit to a roof top kit or can be used on their own as the main solar option.

SO MANY OPTIONS

From the controllers to the connectors, every portable solar kit comes with all the parts you'll need to start harnessing the power of the sun.

PORTABLE SOLAR KITS

- Built-in PWM lithium capable Solar Controller prevents batteries from overcharging (with base kit)
- Maintenance free and no installation or mounting required
- Folds into carrying case for easy transport
- 25 year solar panel warranty

90W

130W

200W

DURALITE PORTABLE SOLAR KITS

- 60% lighter than aluminum-framed kits
- Expandable up to 300W
- Built-in USB charging in the rugged plastic handles
- Magnetic closures keeps panels protected in transit
- Built-in 30-amp PWM lithium capable Solar Controller prevents batteries from overcharging (with base kit)
- Maintenance free and no installation or mounting required
- Folds into carrying case for easy transport
- 2 year solar panel warranty

GP-DURALITE-100E

GP-DURALITE-100

SOLAR PANELS SUMMARY –
WHAT MAKES SENSE FOR YOUR RV?

PORTABLE VS FIXED

For operators looking to add solar, the real question is, "how do you determine which solar solution is right for you?" While traditional fixed-roof solar panels are more durable and user-friendly than ever, emerging portable solutions offer flexibility and a reduced cost of entry.

Let's go through a few of the features and drawbacks of each type of solar kit.

BENEFITS OF PORTABLE RV SYSTEMS

Portable solar systems are optimized for size and weight. This type of panel isn't roof-mounted — instead, it's stored in the RV and only deployed when the camper is parked. Portable panels come in several forms, from small 'suitcase' units to larger units that are standalone or hung from the RV.

The reduced footprint of portable solar systems offers several advantages:

Flexibility. With portable systems, operators don't have to park their RVs in a location that optimizes the sunlight on their rooftop panels. Instead, they can park in the shade or in a spot that affords the most scenic views — all while charging the RV's batteries with a portable panel placed in the sun.

Cost. While portable panels can be more expensive than their rooftop counterparts, they can be cheaper once installation costs are factored in.

Optimizing sunlight. Portable means just that: easy to move. This means the portable panels can be moved throughout the day to maximize their exposure to the sun, keeping the best possible charge coming in.

Ease of use. Using portable panels means no drilling holes, mounting panels on the roof, or running cables through the RV. You can also move the panel from one RV to another without much hassle, should you choose to upgrade.

A great introduction to solar. RV owners who aren't ready to install a fixed solution can begin reaping the benefits of solar with an entry-level portable solar kit. As requirements change, you can expand your portable system or use it as a supplementary charging source should you choose to go fixed.

FOR SOME, FIXED-ROOF IS BEST!

While portable systems have many positives, they aren't ideal for every RVer. In some cases, traditional rooftop systems may be a better fit:

Storage. With space at a premium in RVs and travel trailers, consider that portable panels must be stowed safely when not in use. As power requirements (and the number of panels) grow, storage can become more challenging.

Mobile charging. RVers with fixed solar systems can enjoy charging their batteries anytime it's light out — even while traveling! Portable systems don't offer the same convenience and can only be used when RVs are parked.

Set up. RVers looking to simplify campsite set up may prefer the convenience of fixed-panel rooftop solutions. Portable systems require setup and tear down at each location, adding time and work to every stop.

Scalability. It's easier to accommodate more power with fixed systems. Many RVs and trailers can have up to 1,000 watts of solar panels on their roof, but most wouldn't want to set out and store the equivalent number of portable panels.

Security. Fixed rooftop panels are relatively safe. Portable panels can be dropped, knocked over, or even stolen if left unattended.

For more information to help make your decision, be sure to visit:

gopowersolar.com/choosing-the-right-solar-panel-for-your-rv/

3. SOLAR BATTERIES

RVs typically use deep cycle, valve-regulated lead-acid (VRLA) batteries that can be regularly discharged and recharged. There are two types of VRLA batteries— gel and absorbed glass mat (AGM)—with the latter being more popular.

Lead Acid batteries are likely the stock batteries your RV or travel trailer came with. Lead acid batteries are the most inexpensive batteries on the market today. They require a vented location, regular maintenance, and are one of the older battery technologies available.

AGM batteries offer many advantages to the RVer. They are sealed, do not spill or vent gas, and require no maintenance. AGM batteries also charge quickly and are more resistant to low temperatures. They are, however, sensitive to overcharging and require the use of a charge controller as a preventative measure.

Gel batteries are also sealed and don't spill, but they are much slower to charge than their AGM counterparts. Based on older technology, they also require a charge controller compatible with Gel batteries.

Lithium batteries. The third battery option for your RV is lithium. They provide high performance and efficient charging in a low-weight package. They are safe, require no maintenance, and offer a long life-cycle. The drawback to lithium batteries is cost—these batteries come with a higher price tag.

How many batteries will I need? This will depend on the energy consumption of your RV. The more appliances you plan to run, the higher your consumption will be. RV batteries can also be wired together to form a 'battery bank,' providing either higher voltage (wired in series) or greater capacity (connected in parallel).

Should I choose 6v or 12v batteries? While 6v batteries offer more amp hours, 12v batteries, in some configurations, can provide more redundancy.

Most of your RV applications require 12v current, so you'll need two 6v batteries connected in series* to generate those 12 volts. If one of those 6v batteries go bad, you'll have no usable power.

However, if two 12v batteries are connected and one does not work, you'll still have usable 12v power.

Typically, 6v batteries are used if you're looking for maximum power or are planning to have a large battery bank.

*Go Power! lithium batteries should not be wired in series.

UPGRADING YOUR BATTERY: LITHIUM VS AGM

Which battery is right for you? This handy table gives you an idea of the pros and cons for each battery type.

SUN CYCLE™ LITHIUM BATTERY	
Depth of Discharge	100%
Discharge Temp Range	-4°F to 131°F (-20°C to 55°C)
Discharge Cut-Off Voltage	8.4V
Weight	100Ah: 36lb (16kg) 250Ah: 80lb (36kg)
Cycle Life*	≥3000 @ 100% Depth of Discharge ≥6000 @ 50% Depth of Discharge ≥9000 @ 30% Depth of Discharge
Battery Bank & Wiring	Cannot wire in series; 4x batteries maximum per bank
Certifications	UN 38.3: CE
Protections	Internal Battery Management System (BMS) protects battery from over-charge, over-discharge, over temperature, under temperature and short circuit
Warranty	10-Year

SUN CYCLE™ AGM SOLAR BATTERIES	
Depth of Discharge	50%
Discharge Temp Range	-4°F to 140°F (-20°C to 60°C)
Discharge Cut-Off Voltage	10.5V
Weight	100Ah + 250Ah: 67.5lb (30.6kg)
Cycle Life*	250 @ 100% Depth of Discharge 1100 @ 50% Depth of Discharge 2250 @ 30% Depth of Discharge
Battery Bank & Wiring	Wire in series or parallel. 8x batteries maximum per bank recommended
Certifications	UL, CE, IEC60896-21 & 22
Protections	No BMS
Warranty	2-Year

BUYING TIPS

- If you're starting on your solar journey, high-quality AGM batteries are preferred since they strike the best balance between performance and price.
- **Lead-acid batteries cost less up front. They also need to be maintained to keep them running at peak performance, and have a shorter lifespan.**
- **Lithium batteries are more expensive up front. However, they last far longer, give you more available power, and are maintenance-free.**
- Be sure to check out the manufacturer's battery warranty and ask about their service and support capabilities.
- Ensure you include a battery monitor, or battery manager, and upgrading your stock chargers in your plans to upgrade to lithium.

BUYING RECOMMENDATIONS

SUN CYCLE™ AGM SOLAR BATTERIES

Specifically designed for solar, the AGM deep-cycle batteries offer maintenance-free, sealed construction and integrated carrying handles. UL listed, the battery is available in 6V and 12V models, and comes with a **2-year warranty.**

6 VOLT AGM SOLAR BATTERY

Features
- 6V, 224AH @ C20
- Float application: 6.8 – 6.9V
- Cycle application: 7.2 – 7.4V

12 VOLT AGM SOLAR BATTERY

Features
- 12V, 110AH @ C100 | 100AH @ C20
- Float application: 13.5 – 13.8V
- Cycle application: 14.4 – 15.0V

SUN CYCLE™ LITHIUM BATTERY

Efficient, high-powered performance in a lightweight package, Lithium Iron Phosphate Solar Batteries come in 100Ah, 250Ah sizes and NEW Advanced Lithiums in 100Ah (300Ah coming soon). Built for solar, and carries a **10-year warranty** and offer superior battery protection with a built-in Battery Management System (BMS).

100Ah LITHIUM SOLAR BATTERY

Features
- 12V, 92AH @ C100 | 100AH @ C20
- 36 lbs
- 12.9 in x 7 in x 9.2 in

250Ah LITHIUM SOLAR BATTERY

Features
- 12V, 250AH @ C50
- 80 lbs
- 20.5 in x 8.8 in x 9.5 in

100Ah ADVANCED LITHIUM SOLAR BATTERY

Features
- 12V, 100AH @ C50
- 26.5 lbs
- 20.5 in x 8.8 in x 9.5 in
- Bluetooth®-enabled, smart features

BATTERY MANAGEMENT

A battery manager is an essential component for lithium battery systems. Since Lithiums discharge differently than AGM or Lead Acid, it's virtually impossible to track the remaining power in them. Battery Monitor Kits or Battery Managers are the only way to safely keep an eye on the remaining power in a Lithium batter bank.

BATTERY MANAGER

Easy to read, easy to operate colour touch screen with integrated Bluetooth®. Battery monitor function uses precision current measurement and real-time tracking to show essential battery stats, including:

- ✓ Energy in and energy out
- ✓ Amperage in amperage out
- ✓ Battery capacity remaining
- ✓ Time before battery is charged
- ✓ Custom battery support
- ✓ Features over-the-air firmware updates

BATTERY MONITOR

View your battery's performance with the Go Power! Battery Monitor Kit (GP-BMK-25). Fit for all battery types, the GP-BMK-25, gives you easy to understand battery stats at the push of a button.

- ✓ State of Charge
- ✓ Capacity
- ✓ Voltage
- ✓ Current
- ✓ Two Battery Voltage Display

4. CHARGE CONTROLLERS

The **solar charge controller** is a critical component in your RV solar system. The controller maintains the life of the battery by preventing overcharging. When your batteries are low, the controller provides a full flow of current from your solar panels to replenish your battery bank. When your batteries achieve a 100% charge, the controller limits the current flowing from your solar panels to the batteries.

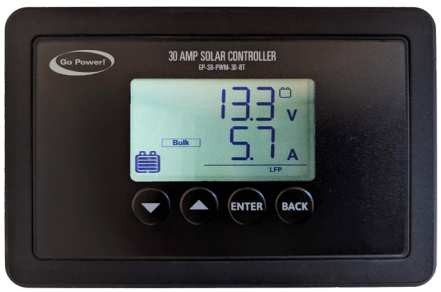
There are different types of solar charge controllers. While simple one or two stage controllers will shut off solar current when your battery is full, **Pulse Width Modulated (PWM)** controllers offer more functionality. They provide greater control of the current flowing from your solar panels and better 'trickle charging' of your batteries.

Maximum Power Point Tracking (MPPT) controllers are up to 30% more efficient than PWM controllers and provide even more control, however the high cost of MPPT controllers remains prohibitive. A top-quality PWM controller is recommended for almost all RV applications.

BUYING TIPS

- Look for a charge controller that has been UL-certified or undergone other independent standards testing Cheaply made charge controllers can give off a lot of electrical ‘noise’ and interfere with some electronics like stereos and televisions.
- Consider emerging features — options such as Bluetooth connectivity that will allow you to monitor and manage your controller remotely.

PWM



- Pulse Width Modulated (PWM) controllers provide greater control of the solar current
- Better ‘trickle charging’ of your batteries
- Economical price point
- Best for smaller solar setups (up to 3 modules not exceeding 30-Amps)

MPPT

- Maximum Power Point Tracking (MPPT) controllers provide a wider range of benefits.
- Up to 20% more efficient than PWM
- Provide more control and expandability options
- Panels can be wired in series for larger systems
- Combined higher DC Voltage allows small gauge wire (10 gauge)
- Better suited for larger installations
- More expensive than PWM

MPPT SYSTEMS

ECLIPSE

Charge batteries faster and maximize your solar charging performance with the new ECLIPSE MPPT SOLAR SERIES. Choose from either a rigid 200-watt or 190-watt SolarFlex™ panel. Kits are expandable up to 3000-watts of solar with stackable controllers*.

Supercharge your solar array to 98% conversion efficiency with MPPT charging. Ideal for series configurations. Bluetooth® enabled remote* allows you to view and change essential battery stats from your handheld device.

Features: RV-C Compatible | Bluetooth® | MAXIMUM POWER POINT TRACKING | Lithium compatible Controller

Choose from 2 PANEL OPTIONS:

RIGID 200 WATT MPPT KIT

- Rigid black-framed 200 watt, 9.6 amp solar module
- Panel dimensions: 59.1 x 26.3 x 1.57 in
- 25-year power output panel warranty

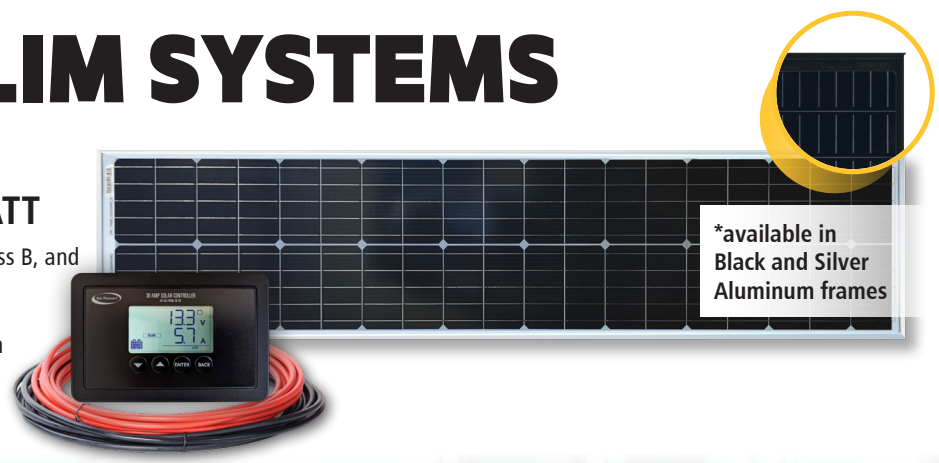
FLEX 190 WATT MPPT KIT

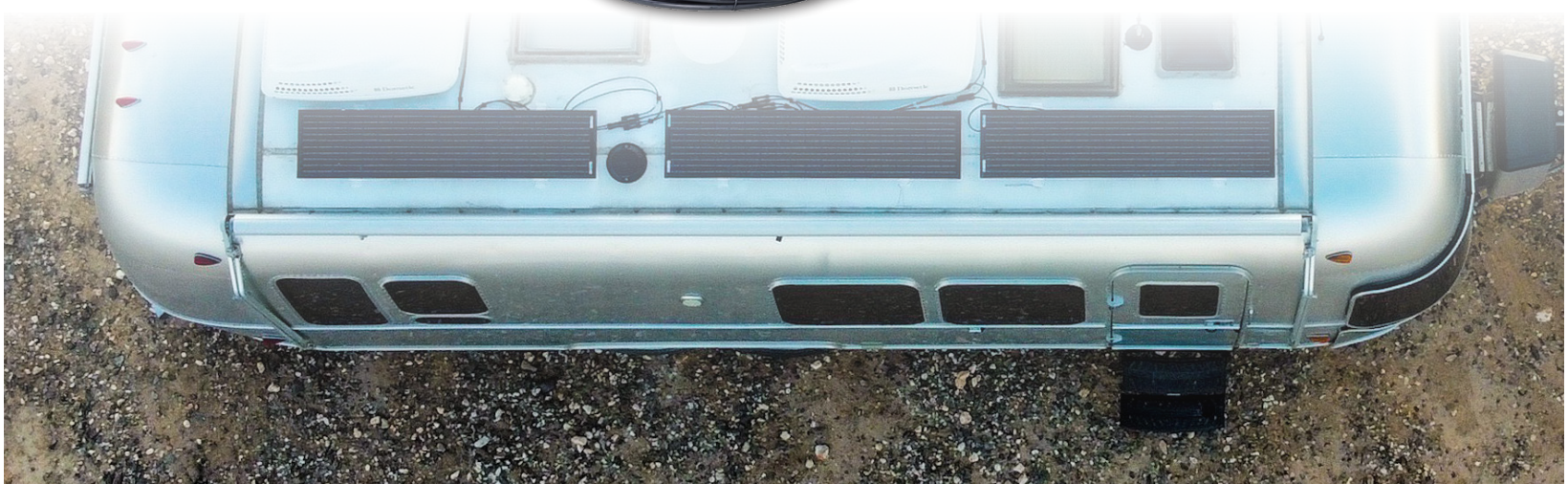
- Black SolarFlex™ 190 watt, 9.45 amp solar module with ETFE top-sheet
- Panel dimensions: 55.98 x 27.2 x 0.1 in
- 5-year power output panel warranty

SLIM SYSTEMS

SLIM SOLAR KIT | 100 WATT

- Ideal for sprinter vans, truck campers, Class B, and units with limited roof space
- Slim 100 watt, 4.7 amp solar module
- Panel dimensions: 60.24 x 13.98 x 1.58 in





5. POWER INVERTERS

While your RV batteries generally provide 12 volt DC power, many of the appliances you run in your RV require 120 volts AC (like in your home). Do you find your outlets don't work when plugged into shore power? That's where an inverter comes in. Making this conversion is the primary role of your RV power inverter.

There are several things to consider when choosing your RV power inverter. First, while most older inverters use **'modified sine wave'** technology (to recreate the AC power profile in your home), many appliances and sensitive electronics run better on the power produced by newer, **'pure sine wave'** inverters. While more expensive, pure sine inverters provide more assurance that all your current and future devices will run optimally.

We recommend choosing an inverter from a company with a proven track record and reliable customer support. Your inverter should have a full range of safety certifications (such as CSA and UL) to ensure safe operation within your RV.

More elaborate converters also give you the capability to charge your batteries when you're plugged into shore power or running a generator. Some even allow you to 'pass through' AC current directly to your appliances when you're plugged into shore power, or to draw shore power and battery power at the same time.

TYPICAL POWER DRAWS

Modified Sine Wave inverters **ARE NOT** recommended for use in RV applications. Check out the comparison chart below to see why Modified inverters are great for commercial use, while Pure Sine inverters are the perfect choice for RVs.

INDUSTRIAL
PURE SINE WAVE INVERTERS

HEAVY DUTY
MODIFIED SINE WAVE
INVERTERS

Appliances and Electronics

Ideal with Pure Sine Wave inverter

Appliance	Watts
Cell Phone	50
Ceiling Fan	75-120
Coffee Maker	800-1200
DVD Player	35-100
Gaming Console	100
Hair Dryer	900-1600
Iron	1000
Light Bulb (incandescent)	100
Light Bulb (fluorescent)	25
Microwave Oven	1500-2000
Mini Christmas Lights (50)	25-75
Computer + Monitor	125
Laptop	25-150
Laser Printer/Fax (printing)	850-1300
Satellite Receiver	10-25
Stereo	250
Tablet (iPad)	100
TV (Flatscreen)	65
TV (25")	300
Toaster	800-1500
Toaster Oven	1500
Toaster Oven (convection)	3000+
Vacuum Cleaner	1225-1500

Common and Commercial Tools

Modified Sine Wave Inverters are ideal for variable speed tools (ie:drills)

Appliance	Watts
1/4" Drill	250
1/2" Drill	750
8" Circular Saw	1800
Air Compressor	2000-3000
Bucket Heater	1500
Charger - Battery powered tools	240-500
Credit Card Machine	100
Electric Chain Saw - (14", 2hp)	1100-3000
Electric Block Heater	750
Fiber Optic Splicer	1000
Grinder - (4 1/2")	25-75
Halogen Flood Lamp	500-750
Hammer Drill	1100-1600
Heat Gun	600-1500
High-Pressure Washer - (1hp)	10-25
Knife Cutter	1100
Reciprocating Saw	1500-1800
Sewer Camera - lights + crawler	500
Shop Vac - (5hp)	1000
Space Heater	1500
Sump Pump - (1/2hp)	1100-2200
Table Saw	1800
Thumper - (electrical fault locator)	1800-2500

6. POWER CONVERTERS, BATTERY CHARGERS, AND TRANSFER SWITCHES

In RV applications, the terms 'power converter' and 'battery charger' are used interchangeably. The converter takes AC power (from shore power or a generator), converts it to DC, and uses it to charge the RV batteries.

BATTERY CHARGER

Good converter/chargers are high-performing and will dramatically shorten the time it takes to charge the batteries — kind of like filling your pool with a fire hose instead of a garden hose. A converter charger will provide savings in generator fuel and shore power charges, and minimizing your generator run times is likely to make you more popular in the RV park.

PRO TIP

If you are looking to upgrade to Lithium batteries, make sure your charger has a charging profile that allows it. Check out our blog post for more information ***gopowersolar.com/upgrading-your-rv-batteries-to-lithium-what-you-need-to-know/***

TRANSFER SWITCH

Transfer switches provide both safety and convenience—who wants to be manually transferring power sources at night or in the middle of a storm?

Transfer switches automatically switch between two sources of incoming AC power. It's critical that different AC power sources are kept separate from each other—failing to do so can result in damaged electrical equipment or even fire.

Once the different AC power sources are attached to the transfer switch, the switch will select the appropriate power source to use based on your preferences. For example, it can send power to your RV refrigerator when you're driving, allowing you to turn off the fridge's propane source (a safety issue when on the road).

3 COMPONENTS IN 1

INVERTER/CHARGER UNITS

IC Series™

Using a “combo unit” in your RV solar installation can cut your installation time significantly. Look for a unit that combines an inverter, a battery charger and a transfer switch. By combining these 3 products into one point of installation, you’re removing additional wiring, switches and potential failure points in your RV’s power system.

To safely run your all your devices off-grid, look for an inverter/charger unit that uses “pure sine wave” power, and has a safety certification, like UL or CSA.

APPENDIX 1 – RV COMPONENTS SUMMARY

A well-designed RV solar solution built with quality components will provide you with the ultimate flexibility for going off grid and should give you years of trouble-free service. Here are a few things to keep in mind when choosing your solar set-up:

Understand your current and future requirements. Are you a casual RVer, or a hardcore boondocker? What about in the future—will your needs change? Allowing for future requirements when building out your solar system can help you avoid costly retrofits down the road.

Always choose high-quality components. Check the manufacturer's written specifications, read reviews from other customers and understand your warranty options.

Choose your dealer or installer carefully. Your RV solar dealer should be manufacturer certified and have experience with your applications and vehicle type. A good dealer will help you assess your system requirements, design your system, recommend top quality components, perform expert installations, and provide excellent post-sale service and support.

Get on the road and have fun! It's a big world out there. With a quality RV solar system, you'll be able to see much more of it—even if you choose to go off the beaten path.

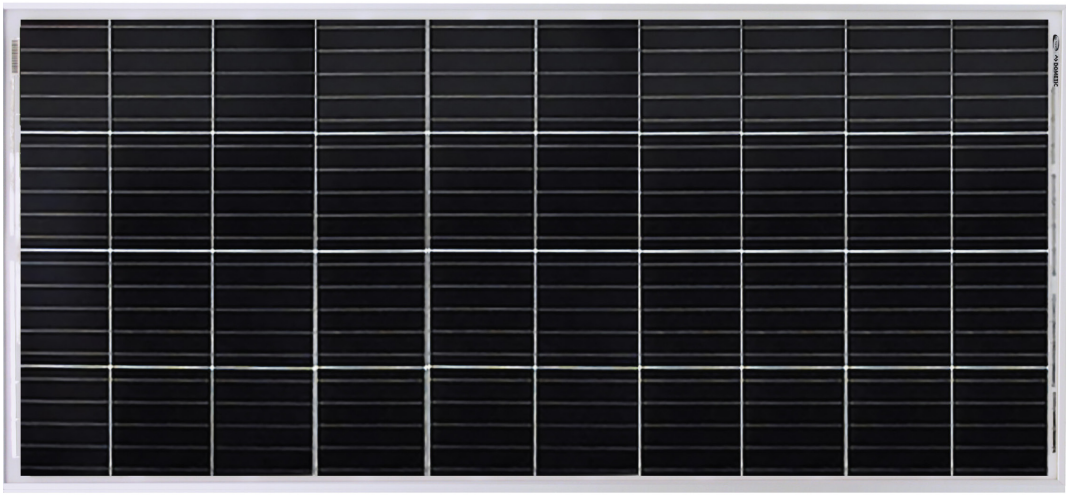
APPENDIX 2 – SOLAR SIZING FOR YOUR RV

So now that you know all about how solar works, how do you know what size of solar system is right for you? Go Power! has a number of ways to help you find the right system for your RV, boat or work truck. Our **Simple Sizing Chart** (page 24) and **Solar Sizing Worksheet** (page 25) will provide you with Go Power! mobile power equipment recommendations based on your RV type and specific power usage.

SOLAR SIZING

Step 1: Use the chart on Page 30 to identify the DC and AC power appliances and # of hours each runs/day.

Using the tables on the Solar Sizing Sheet, start adding up your daily power draws.



SOLAR SIZING
(CONTINUED)

Step 2: Calculate the Total Weekly Amps

Multiply total amp hours per day by the number of days per week (i.e.: weekend camping: multiply total amp hours x 2 days, full-time camping: multiply total amps per day x 7 days).

Step 3: Match your Total Weekly Amps with a solar charging kit or complete system

Find your perfect solar solution!

The values on our **Solar Sizing Worksheet** assumes typical power output is based on 6 hours charging per day and will vary at different times of the year, by location, and with varying weather conditions. For more accurate sizing, including using your location, be sure to visit our online calculator tool (coming soon).

Check out our interactive, easy-to-use online calculator:
https://gopowersolar.com/calculator/

MOBILE POWER SYSTEMS

Buying a complete mobile power system makes it easy to add solar battery charging and AC household power to your RV. The systems listed below outline the type of RV or trailer they can power, for how long, and what size battery bank is recommended.

Compatible with WIRED FOR SOLAR™ Pre-wired for Solar RVs

WEEKENDER ISW
(200 watts)

OR OR

Pair with: 200AH+ AGM 100AH+ LITHIUM

Be a weekend warrior.

7+ days

- 200 watt, 9.6 amp (1x 200W module)
- Bluetooth®-enabled 30 amp PWM digital controller
- 1500 watt industrial pure sine wave inverter
- Prewired 30 amp transfer switch
- Inverter install kit and remote

SOLAR ELITE
(400 watts)

+ OR

Pair with: 400AH+ AGM 200AH+ LITHIUM

Plan an extra long weekend.

4-7 days

- 400 watt, 19.2 amp (2x 200W modules)
- Bluetooth®-enabled 30 amp PWM digital controller
- 2000 watt pure sine wave inverter charger (with built-in 100 amp battery charger and 50 amp transfer switch)
- Inverter install kit and remote

SOLAR EXTREME
(600 watts)

+ +

Pair with: 500AH+ AGM 250AH+ LITHIUM

Great for full-time rving.

1-4 days

- 600 watt, 28.8 amp (3x 200W modules)
- Bluetooth®-enabled 30 amp PWM digital controller
- 3000 watt pure sine wave inverter charger (with built-in 125 amp battery charger and 50 amp transfer switch)
- Inverter install kit and remote

APPENDIX 3 – SOLAR GUIDELINES AND WORKSHEET

SOLAR SIZING GUIDELINES

Use the chart below to find out what solar and inverter kits will work best for an average RV in each class. Visit our website and use our calculator at gpelectric.com/calculator to find the best Go Power! solution for your needs.

Battery calculations below are based on 200 amps of battery power for every 190 watts of solar. Go Power! offers 100Ah and 224Ah AGM batteries as well as 100Ah and 250Ah Lithium batteries.

	CLASS A (GAS OR DIESEL)		FIFTH WHEEL / TOYHAULER		CLASS C	
						
	1-3 DAYS AWAY	7+ DAYS AWAY	1-3 DAYS AWAY	7+ DAYS AWAY	1-3 DAYS AWAY	7+ DAYS AWAY
SOLAR	400+ watts	800+ watts	400+ watts	800+ watts	200+ watts	400+ watts
INVERTER	2000/3000 watt pure sine	2000/3000 watt pure sine	2000/3000 watt pure sine	2000/3000 watt pure sine	2000 watt pure sine	2000 watt pure sine
AGM BATTERIES	400Ah+	600Ah+	400Ah+	600Ah+	400Ah+	600Ah+
LITHIUM	200Ah+	400Ah+	200Ah+	400Ah+	200Ah+	400Ah+
TRY	Overlander + Expansion kit	Solar AE 4 or Solar AE-6	Overlander + Expansion kit	Solar AE 4 or Solar AE-6	Overlander Kit	Overlander + Expansion kit

	CLASS B		TRAVEL TRAILER		POP-UP OR TRUCK CAMPER	
						
	1-3 DAYS AWAY	7+ DAYS AWAY	1-3 DAYS AWAY	7+ DAYS AWAY	1-3 DAYS AWAY	7+ DAYS AWAY
SOLAR	100+ watts	300+ watts	200+ watts	400+ watts	100+ watts	200+ watts
INVERTER	2000 watt pure sine	2000 watt pure sine	2000 watt pure sine	2000 watt pure sine	2000 watt pure sine	2000 watt pure sine
AGM BATTERIES	200Ah+	400Ah+	200Ah+	400Ah+	100Ah+	200Ah+
LITHIUM	100Ah+	200Ah+	100Ah+	200Ah+	100Ah+	200Ah+
TRY	Retreat or Flex-110 kit	Retreat + 2x Retreat-E or Flex-220 kit + Flex-110E	Overlander Kit	Overlander + 1x Expansion kits	Retreat or Flex-110 Kit	Retreat +1 Expansion or Flex-110 kit + 1 Expansion

To learn more about solar systems, visit our website at gopowersolar.com/education

SOLAR SIZING WORKSHEET

How much power do you need? Consider how many days you'll be off the grid and how much power you'll use. Keep costs down by sizing for just what you need. Most Go Power! solar kits and systems are easily expandable as your power needs grow.

Step 1: Fill in the quantity of items and number of hours each appliance runs per day.

12V, DC Appliances	Amps	X Qty.	X Hours Run Per Day	= Total Amp Hours
LED Light	0.08			
Incandescent Light	1.25			
Water Pump	4			
12 Volt TV	3			
SC Fan*	4			
Furnace Fan*	8			
12 Volt Stereo	0.8			
Refrigerator	3			
Propane Alarm	0.21	1	24	5.04
Other				

*Fan and furnace are not typically run at the same time.

120V, AC Appliances*				
AC Fridge**	10			
TV	4			
VCR	3			
Satellite Dish	4			
Microwave	100			
Toaster	66			
Coffee Maker	60			
Blender	12			
Computer	25			
Laptop Computer	5			
Other				

*All amperage ratings are based on a 12 volt system.
**Fridge amps based on a 4.4 cubic foot fridge, running 12-hours/day.

Total amp hours per day	

Step 2: Total Weekly Amps Calculation

Multiply total amp hours per day from Step 1 by the number of days of use per week (i.e.: weekend camping: multiply total amp hours x 2 days).

Amps Per Day:	
X	
# of Days of Use Per Week:	
=	
Amp Hours Per Week	

*When sizing your battery bank

Step 3: Solar Power Output
Match your power draw from Step 2 to the product listed below:

Amp Hours Per Week	Recommended Solar Kit (DC only)	AGM Battery Bank	Lithium Battery Bank
29	10W Eco Kit	100Ah	100Ah
55	20W Eco Kit	100Ah	100Ah
71	35W Solar Flex Kit	100Ah	100Ah
117	55W Solar Flex Kit	100Ah	100Ah
197	80W Eco Kit	200Ah	100Ah
193	90W Portable Solar Kit	200Ah	100Ah
212	100W DuraLite Kit	200Ah	100Ah
228	100W Retreat Kit	200Ah	100Ah
236	100W Slim Kit	200Ah	100Ah
236	110W Solar Flex Kit	200Ah	100Ah
290	130W Portable Solar Kit	200Ah	100Ah
403	200W Overlander Kit **MOST POPULAR KIT**	200Ah	100Ah
397	190W Eclipse Kit (FLEX)	200Ah	100Ah
403	200W Eclipse Kit (RIGID)	200Ah	100Ah
472	200W - 100W Duralite Kit + 100W Duralite Expansion Kit	200Ah	100Ah
472	200W - 100W Slim Kit + 100W Slim Expansion Kit	200Ah	100Ah
470	200W Portable Solar Kit	200Ah	100Ah
477	220W Solar Flex Kit	200Ah	100Ah
573	300W - 100W Duralite Kit + 2x 100W Duralite Expansion Kits	400Ah	200Ah
708	300W - 100W Slim Kit + 2x 100W Slim Expansion Kits	400Ah	200Ah
806	400W 200W Overlander Kit + 200W Overlander Expansion Kit	400Ah	250Ah
806	400W 200W Eclipse Kit + 200W Eclipse Expansion Kit	400Ah	250Ah
1192	550W Solar Flex Kit	400Ah	400Ah+
1209	600W - 200W Overlander Kit + 2x 200W Overlander Expansion Kits	400Ah	400Ah+
1190	570W - 190W Eclipse Kit (FLEX) + 2x 190W Eclipse Expansion Kits	400Ah	400Ah+
1209	600W - 200W Eclipse Kit (RIGID) + 2x 200W Eclipse Expansion Kits	400Ah	400Ah+
1612	800W Solar All-Electric Kit	800Ah+	800Ah+
2419	1200W Solar All-Electric Kit	1000Ah+	1000Ah+
	Recommended Complete Systems (DC and AC)		
403	200W Weekender System	200Ah	100Ah
806	400W Solar Elite System	400Ah	250Ah
1209	600W Solar Extreme System	400Ah+	400Ah+
1612	800W Solar AE 4 & IC Series Inverter/Charger	800Ah+	800Ah+
2419	1200W Solar AE 6 & IC Series Inverter/Charger	1000Ah+	1000Ah+

Please note: Amp hours based on 6 hours of usable light per day.

In this example, AC amps are converted to DC by multiplying by 10. This isn't 100% accurate, but it allows you to make AC to DC calculations quickly.

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SOLAR | INVERTERS | CHARGERS | BATTERIES

After 25+ years in the mobile power business, we know how to build high-performance products. With over a million solar panels sold to customers across North America, Go Power! products have a proven record of quality and reliability in harsh environments.

Our solar panels, power inverters, and battery systems work together to bring electricity wherever grid power is unavailable or unsustainable. By pairing high-quality components and unparalleled customer service, Go Power! offers reliability in unpredictable conditions. When you need portable, renewable electricity, you can count on Go Power!

RV MANUFACTURERS WE WORK WITH

Forest River · Thor Motor Coach · Jayco · Triple E Recreational Vehicles · Winnebago · Lance · Pacific Coachworks · Travel Lite RV · Tiffin Motorhomes · Fleetwood · Genesis Supreme · Host Campers · K-Z Recreational Vehicles · Pleasure-Way · Ember Recreational Vehicles · Grand Design Recreational Vehicles

...and many more!

1 IN 3 RV's now Pre-wired for Go Power! Solar