



FAQs



KEYSTONE
RV COMPANY

SOLAR

WHAT IS SOLAR?

The term "Solar power" or "Solar energy" is referring to the process of using photovoltaic cells to convert energy from the sun into electric power.

WHAT IS NEEDED FOR SOLAR?

This requires a minimum of a solar panel, solar controller, battery(s) as well as properly sized wires/cables and circuit protection (fusing).

WHY DO I NEED SOLAR?

Solar power is used to replenish (or charge) battery(s) without using the shore cord/converter or another AC power source such as a generator.

DOES SOLAR WORK AT NIGHT?

No, Solar does not produce electricity at night.

CAN I EXPAND MY SOLAR CAPABILITY?

All SolarFlex systems were designed to be expandable (providing you have open roof space). We recommend using a solar calculator (Google it) to determine how much energy you will typically use/need for your type/style of camping. Once that is determined, your Keystone dealer can outline the different expansion options available. More information is also available at www.keystonerv.com under Solar Flex.

HOW DO I ADD SOLAR TO MY RV?

Starting with 2022 model year, all Keystone Travel Trailers and Fifth wheels come standard with a 200 SF SolarFlex package which includes a 200 Watt Solar panel, 15 Amp MPPT Smart Solar Controller, 30 Amp Solar Roof Ports and pre-wired to add an inverter. Depending on the brand and model, SF 400i, SF 600-iL and a SF 1200-iL (Montana only) could be optioned. However, regardless of the Solar Flex package that is on your Keystone RV when built, we designed Solar Flex to be customized and expanded by your Keystone dealer to fit a wide variety of camping needs. For more information, visit Solar Flex at www.keystonerv.com or contact your local Keystone dealer to get you started.



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WHY CAN'T I BUILD OUT MY SOLARFLEX 200 TO BE LIKE THE SOLARFLEX 400i?

Keystone RVs with the SolarFlex 400i package have a second inverted loop, 120 Volt pre-wire to the primary roof A/C and dedicated circuit breaker that aren't included in the SolarFlex 200 package. While owners could technically add these items to the RV after purchase, it would be a rather large and expensive installation. While one can't completely turn SolarFlex 200 into SolarFlex 400i, you can easily match the solar power collection by adding a second 200w panel, increase charging speed by upgrading to a 30 amp solar controller, and power your 110v outlets by adding a 2000 watt inverter. The only thing that is really missing would be the components necessary to run the RV's air conditioner. Please see the "expand your system" section of the SolarFlex 200 page for a full list of upgrade options.

WHY CAN'T I BUILD OUT MY SOLARFLEX 400i TO BE LIKE THE SOLARFLEX 600i-L?

SolarFlex 600i-L features a different distribution panel with built-in sub-panel, additional 10/2 wiring, and a lithium ion battery that aren't included in the SolarFlex 400i package. These components are easy to include during the build process, but much more difficult and expensive to add after delivery. However, the SolarFlex 400i package can be easily expanded to provide much of the functionality of SolarFlex 600i-L by upgrading the solar charge controller, adding additional solar panel(s), adding another inverter or upgrading the inverter, adding battery capacity, and upgrading to a soft start air conditioner. For a complete list of expansion options and parts recommendations, please see the "expand your system" section of the SolarFlex 400i page.

DO I NEED TO DO ANYTHING TO MY CAMPER BEFORE PLUGGING INTO THE CAMPSITE WITH SOLAR?

No, solar charging is completely independent from the shore line cord/converter. The solar charge controller reads the level of the battery, then only allows through the charge actually needed by the battery so you never have to worry about overcharging or damaging your battery.

WHAT DO I DO IF IT IS RAINING CLOUDY OR NO SUN?

In this situation, there are only 2 options: 1) Practice energy management to reserve your battery capacity until which time the sun becomes available again 2) Recharge the battery(s) by shore cord/converter, generator or running the tow vehicle while the pigtail (7-Way) is plugged into the RV. Note: Using the tow vehicle may not work with Lithium, see FAQ regarding charging the battery while driving down the road.



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SOLAR PANELS

HOW MUCH WATTAGE SHOULD I SEE FROM THESE?

{200W OR 300W PANELS ONLY}

Best case/Perfect conditions: 180 watts (200 Watt panel) and 270 Watts (300 Watt Panel). However, conditions are significantly variable: 1) Battery(s) State of Charge (SOC)-The higher the SOC, the less charge being sent by the solar controller because the battery doesn't need it, the lower the SOC, the more the charge that is sent 2) How much sun is actually reaching the solar panel- time of day (sun low), time of year (less hours of total sun), angle of the panel to the sun, trees/leaves blocking how much sun reaches the panel 3) How clean is the solar panel. These are just a few....

WHAT MAINTENANCE IS NEEDED FOR MY SOLAR SYSTEM?

Your Solar system is relatively easy to maintain: 1) Keep your panels clean so they can absorb as much sunlight as available 2) follow Keystone's requirements to inspect/maintain roof seams/joints/attachments as outlined in the Owner's Manual.

HOW DO I CLEAN THEM?

It is best to clean the panels with only a wet rag, then wipe them dry with a soft cloth.

BATTERIES

WHAT BATTERIES ARE RECOMMENDED FOR SOLAR APPLICATIONS?

Lead Acid, Absorbed Glass Mat (AGM) or Lithium ion can be used for solar applications.

WHAT IS THE DIFFERENCE BETWEEN LEAD ACID, AGM AND LITHIUM?

Lead Acid (oldest technology invented in 1859) - a rechargeable battery with dilute sulphuric acid as the electrolyte that allows for discharge and recharge.

AGM (newer technology) - is an advanced lead acid battery that has a longer life span, higher electrical loads, and quicker recharge time than the standard Lead Acid Battery.

Lithium (Newest technology) - a rechargeable battery that uses lithium ions as the primary component of its electrolyte.

HOW ARE LITHIUM BATTERIES DIFFERENT FROM TRADITIONAL LEAD-ACID BATTERIES?

Lead-acid is a tried-and-true technology that is economical, but requires regular maintenance and doesn't last as long. Lithium is a premium battery technology with a longer lifespan, higher efficiency, and better performance and is lighter weight. Properly used and maintained, they can last as much as 7-10 years.



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WHICH BATTERY TYPE IS BETTER, LEAD-ACID, LITHIUM OR AGM?

When using multiple 120 volt components or those that consume more energy (higher load such as a microwave, coffee maker, or hair dryer) for longer periods of time, lithium wins hands down. Lithium not only allows you to pull more energy at a faster rate but also recharges faster. However, we know that Lithium may not be practical for everyone, so if you are someone who typically uses their RV for a weekend at a park or unplugged for short periods of time, not using higher load 120 volt components much, then a couple of AGM batteries will most likely serve you well. If traveling often, longer trips, using multiple or higher load 120 volt components with no access to plug in a shore cord or run a generator, Lithium is well worth the additional cost.

Important Note: Not all "Lithium" batteries are equal. There are actually several different chemistry combinations that all fall into the lithium ion category. The lithium solutions we offer is LiFePo4. This is a category where cheaper is not necessarily better.

CAN I ADD MORE BATTERY(S) LATER?

Yes, as long as they are the same type and size as what is currently installed and wired in parallel.

WILL MY RV BATTERY CHARGE FROM MY TOW VEHICLE WHILE I AM DRIVING DOWN THE ROAD?

- » Tow vehicles may be equipped with a "smart alternator" which is designed to read the battery voltage and only send a charge if necessary. Because Lithium batteries maintain high voltage even while being depleted of energy, the "smart alternator" can misread the need and not send recharge the RV battery(s) while driving. There are aftermarket products that can help overcome this if charging while driving is important for your application.
- » For more information please watch these videos from Battle Born Batteries:
- » FAQ: Can I charge my batteries using the alternator? | Battle Born Batteries <https://youtu.be/VY2b71zoyvg>
- » FAQ: Comparing DC to DC Chargers | Battle Born Batteries <https://youtu.be/GpNDeQN4O-o>

INVERTER

WHAT IS THE DIFFERENCE BETWEEN A CONVERTER AND AN INVERTER?

A converter takes 120 volt Alternating Current (AC) and converts it to 12 Volt Direct Current (DC) which allows you to run your 12 Volt components in your RV. An Inverter takes 12 Volt Direct Current (DC) from your properly charged RV battery(s) to create 120 Volt Alternating Current (AC) in order to run 120 Volt components in your unit.



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ARE THERE DIFFERENT TYPES OF INVERTERS?

We use two types of inverters. 1) Stand-alone inverters-converts DC power from the batteries to AC power for the outlets or other 120 Volt appliances. 2) An inverter charger-does the same but also converts outside AC power (shore power or from a generator) to DC power to charge the RV battery(s).

DOES MY INVERTER NEED TO BE TURNED ON IF NOT IN USE?

The inverter disconnect and inverter can be left on during normal use which will allow it to automatically engage in the event you are disconnected from shore cord power. Both should be turned off while servicing the 120 Volt system or and during storage.

WHY DO I SEE VOLTAGE, BUT NO AMPS FROM MY SOLAR CONTROLLER?

If the RV battery(s) are fully charged and there are no large load demands on the system, the solar smart controller limits the amount of amperage sent to the battery to avoid overcharging and damaging it.

INVERTER DISCONNECT

WHAT IS THE BIG RED DISCONNECT SWITCH?

This disconnects the power between the batteries and the Inverter ONLY. This does not disconnect the battery power from the rest of the 12 volt components in the unit.

WHEN DO I USE IT?

Inverter disconnect should only be turned off along with the inverter (if equipped) when the 120 volt system is being serviced or the unit is being put in storage.

SOLAR CHARGE CONTROLLER

WHAT IS A SOLAR CHARGE CONTROLLER?

The Smart MPPT controller is what is used to regulate the energy the solar panel collects that is passed through to the battery. When battery(s) are in a discharged state, the controller will allow maximum power through to recharge the battery(s) as fast as possible. When it senses the battery(s) are fully charged, it will significantly reduce/stop what power is allowed through to avoid over charging or damaging the battery(s).



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DO I NEED TO SHUT OFF MY SOLAR CONTROLLERS IF I AM PLUGGED IN TO SHORE POWER?

No, the solar system and shore power system are separate. The MPPT solar controller(s) offered all work in conjunction with any and all other charging sources. Since the controller senses the battery needs, they will avoid overcharging and damaging the battery(s).

WHY DO YOU USE MULTIPLE, SMALLER CONTROLLERS INSTEAD OF A SINGLE LARGER CONTROLLER?

There are a couple of reasons we set our solar installs up with multiple smaller controllers in lieu of a single larger controller.

- 1) Breaking up large arrays allows us to use smaller gauge wire reducing the weight being added to the coach.
- 2) Using two 50 amp controllers allows for the array to be on 2 completely independent circuits giving you added peace of mind that whether due to shade or damage occurring to one of the circuits, the other is working!

HOW TO RESET THE SOLAR CHARGE CONTROLLER?

This applies to the Jaboni Power Product only. There is a reset button on the side of the solar controller. Press and hold for 3 seconds, then release. To reset the remote display, simultaneously press the up and down arrows with the power button.

SMART SHUNT

WHAT IS A BATTERY SHUNT (SMARTSHUNT) AND WHAT DOES IT DO?

A shunt is a precision resistor that allows you to monitor your battery(s). It measures battery voltage and current (amperage). The Victron SmartShunt we use, records the battery(s) recharging rate and energy consumption at that moment in time in order to calculate the % of battery charge and the "Time Remaining" before the battery(s) are discharged. It also keeps track of historical data, such as deepest discharge, average discharge and number of charge/discharge cycles.



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HOW DO I VIEW INFORMATION?

Using the built-in Bluetooth broadcasting to link a smart phone or tablet to the Victron Connect app.

WHAT DOES THIS INFORMATION ON THE APP MEAN?



SOLAR CONTROLLER

SOLAR

The Solar App Displays the Solar input values from the panels to the Solar Controller.

BATTERY

The next segment of the app displays the charge being delivered to the battery.

LOAD OUTPUT

Displays status of dedicated load output from Solar Controller. This is a feature that can be used but is not active on SolarFlex. Refer to the User Manual.



SMART SHUNT

STATE OF CHARGE

Battery state of charge in (%) percentage is displayed first.

OUTPUT

Output shows: Voltage, Current, Power, Consumed AH, and Time Remaining.

N/A

This is a feature that can be used on motorized units but is not active on this system.