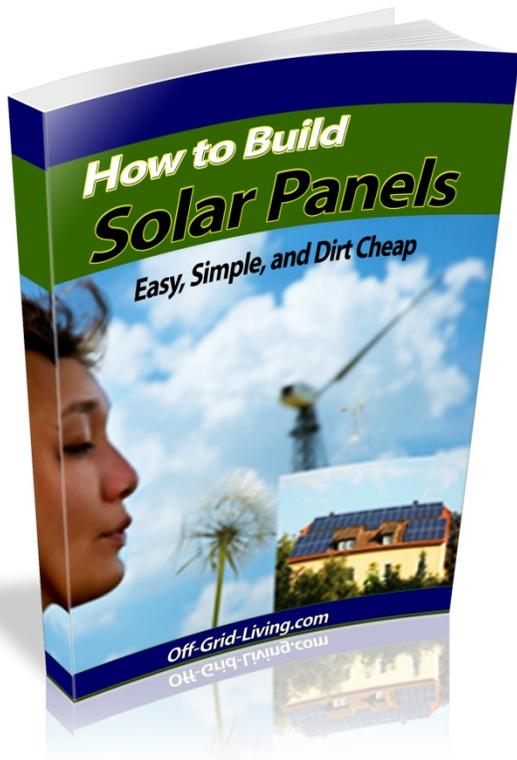


# ff-Grid-Living

In An Urban and Suburban World



## Lesson #16 ... Solar System Components

# The Disclaimers, Legal Stuff and Butt-Covering Section:

*Before attempting to build a solar system for your entire house, take my course "Home Energy Made Easy" Go here: <http://Off-Grid-Living.com> I'll give it to you for free for being a member of this course. Understanding the concepts in that course will save \$1000's of dollars when you go to build your system.*

This is but one small section of a complete action plan for building solar panels dirt cheap. Which is one small section of a course on going off the grid in Urban/Suburban America. You can learn how to

- Grow your own food year around, no matter where you live.
- Slash your energy and living expenses by 50% or more.
- Create your own fuel
- Finding economical shelter
- Alternative methods of (Legally) making money
- How to live anonymously

Check out <http://Off-Grid-Living.com>

**NOTICE: You Have the Right Give This To Anyone You Want!**

**But You Can't Resell this Report for your own profit!**

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# How To Build Solar Panels

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## Introduction

This lesson we will speak about how to create your own power system in your home so that you can power every day small appliances, such as cell phones, laptops, TV's, etc. One solar panel will not power your house, but a solar array might. Of course, I don't know what you've built, or what you'll be using it for. So once again, I'm going to speak in general terms.

First, we need to talk about the 3 primary components you'll need.

- Charge controller
- Deep cycle batteries
- Inverter.

A charge controller maintains the electrical current from your solar panels to your batteries and prevents the batteries from being over-charged as well as prevents the backflow of current. The charge controller is the brains of the entire system. Or maybe you could look at it as a policeman directing the flow of electrical current.

Not all charge controllers include the same features. The features you're most interested in is preventing the back flow of current, and the ability not to overcharge your batteries. For the panel you just built, a basic charge controller will do.

**One important** thing you need to know is how many amps your solar panel produces. If you built the one outlined in this course, using 36, 3x6 inch solar cells, you should be producing 3.5 amps. You can also check the amps yourself while the panel is in direct sunlight.

If your solar panel is producing 3.5 amps, I'd get a charge controller that can handle 4 amps or more. The deciding factor will be if you plan on adding more solar panels. The more amps, the larger charge controller you'll need.

For the purpose of this tutorial I'm going to go with a simple charge controller that has the 2 features I just talked about. So I'm looking for a charge controller that can handle 4 amps or more, prevent over charging, and a back flow preventer.

Back to Amazon.

On the first page I ran across this one: <http://www.amazon.com/dp/B015S39PTU?psc=1>

\$30 and can handle up to 20 amps.

# How To Build Solar Panels

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Patio, Lawn & Garden - Best Sellers - Deals - Gardening - Outdoor Décor - Patio Furniture - Grilling - Mowers & Landscaping Tools - Pools & Spa Supplies - Snow Removal - Generators - Pest Control - Watering - Wedding Registry

Patio, Lawn & Garden - Generators & Portable Power - Solar & Wind Power - Energy Controllers

WindyNation P20L LCD 20A PWM Solar Panel Regulator Charge Controller with LCD Digital Display and User Adjustable Settings

by WindyNation

★★★★★ 73 customer reviews | 63 answered questions

Price: \$29.99 Prime

In Stock

Want it tomorrow, April 14? Order within 6 hrs 33 mins and choose One-Day Shipping at checkout. Details

Sold by WindyNation and Fulfilled by Amazon. Gift-wrap available.

Size: 20A Charge controller

20A Charge controller \$29.99 Prime

30A Charge Controller \$49.99 Prime

- WindyNation P20L PWM 20 Amp solar charge controller prevents battery from being overcharged and damaged by the solar panel. Ideal for 12 and 24 volt batteries. Controller can be configured for AGM, lead acid, gel and other battery types.
- Advanced electronic protection: overload, short circuit, and reverse polarity protected.
- LCD digital display provides system information (voltage, temperature, load control etc.)
- Designed with a microcontroller for automatic lighting control functions
- System settings are user adjustable by using the buttons on controller

Roll over image to zoom in

Frequently Bought Together

Total price \$183.47

Share

Qty: 1

Add to Cart

Turn on 1-Click ordering for this browser

Ship to: David Sieg-Urbandale

Add to List

Have one to sell? Sell on Amazon

HQST High Quality Solar Panels & A...

HQST 100 Watt 12 Volt Monocrystalline Solar Panel

★★★★★ 1

\$149.99 \$119.99 Prime

Ad feedback

Keep in mind; I'm not suggesting this brand, or any particular charge controller. I'm simply showing you where to go and what to get.

Ok, deep cycle batteries.

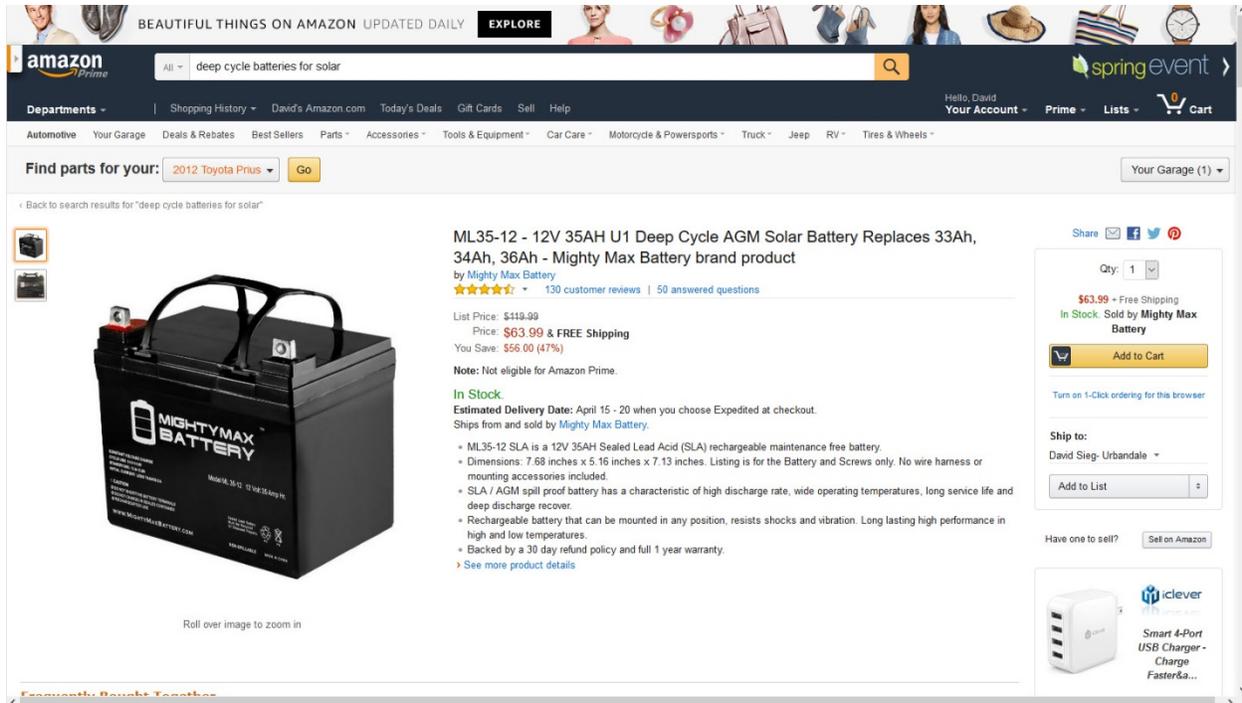
This is a portable battery designed to keep a steady amount of current over a long period of time. They can also be deeply discharged over and over again, unlike a standard car battery. In short, they are used in heavy-duty and industrial/commercial applications. Forklifts, and marine batteries are usually deep cycle.

Even though it is made to handle constant discharging, I wouldn't recommend doing so with a solar system. I wouldn't allow the battery to become drained more than 60%-80%. (This can be controlled via the charge controller) Staying within those guidelines will extend the life of the battery for years.

A typical 12v. deep cycle battery will cost anywhere from \$60 on up. Amazon, of course, will have them.

[http://www.amazon.com/ML35-12-Battery-Replaces-Mighty-product/dp/B00K8E0WAG/ref=sr\\_1\\_3?ie=UTF8&qid=1460561268&sr=8-3&keywords=deep+cycle+batteries+for+solar](http://www.amazon.com/ML35-12-Battery-Replaces-Mighty-product/dp/B00K8E0WAG/ref=sr_1_3?ie=UTF8&qid=1460561268&sr=8-3&keywords=deep+cycle+batteries+for+solar)

# How To Build Solar Panels



The screenshot shows an Amazon product page for a 'Mighty Max Battery'. The product is a 'ML35-12 - 12V 35AH U1 Deep Cycle AGM Solar Battery Replaces 33Ah, 34Ah, 36Ah - Mighty Max Battery brand product'. The price is listed as \$63.99 with free shipping, and it is noted as 'In Stock'. The page includes a large image of the battery, a list of specifications, and a 'Buy Now' button. The specifications list include: ML35-12 SLA is a 12V 35AH Sealed Lead Acid (SLA) rechargeable maintenance free battery; Dimensions: 7.68 inches x 5.16 inches x 7.13 inches; SLA / AGM spill proof battery has a characteristic of high discharge rate, wide operating temperatures, long service life and deep discharge recover; Rechargeable battery that can be mounted in any position, resists shocks and vibration. Long lasting high performance in high and low temperatures; Backed by a 30 day refund policy and full 1 year warranty.

So, you say you don't like Amazon? No sweat, you can also find deep cycle batteries at automotive stores, like NAPA, Autozone, Pep Boys and the like.

Also refer to the section of this course on how to get free deep cycle batteries.

A note about charging a deep cycle battery: in order to charge a 12 volt battery with your solar panel, your panel needs to be producing at least 18 volts. The panel made in this tutorial does. Even though it is 12 volt battery, you have to be producing more electricity than the battery is rated for.

(Remember, 36 solar cells, rated at 0.5 volts each, hooked up in a series.  $0.5 \text{ volts} \times 36 = 18 \text{ volts}$ )

Next, we need to talk about the inverter.

An inverter is a device that converts Direct Current (DC) to Alternating current (AC) the kind of current that most household appliances run on.

Your solar panel produces direct current. So you need a way to convert the solar energy into a useable form for your household. This is where the inverter comes in.

There are 2 types of converters you need to be concerned with:

- A modified Sine Wave Inverter
- Pure Sine Wave Inverter

# How To Build Solar Panels

A modified sine wave converter is usually used for household appliances and devices.

A pure sine wave inverter is usually used to more complex solar systems.

So you want to buy a modified sine wave converter. They can be bought usually at any electronic store, and of course, Amazon.

[http://www.amazon.com/ERAYAK-Inverter-Cigarette-Alligator-Tablet-8095U/dp/B019PTST18/ref=sr\\_1\\_16?ie=UTF8&qid=1460562012&sr=8-16&keywords=inverters+for+solar+panels](http://www.amazon.com/ERAYAK-Inverter-Cigarette-Alligator-Tablet-8095U/dp/B019PTST18/ref=sr_1_16?ie=UTF8&qid=1460562012&sr=8-16&keywords=inverters+for+solar+panels)

Here's one for \$30

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All inverters for solar panels

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Cell Phones & Accessories Contract Phones No-Contract Phones Unlocked Phones Accessories Cases Wearable Technology Best Sellers Deals Trade-In All Electronics

Back to search results for "inverters for solar panels"

ERAYAK 300W Car Power Inverter Dual US Outlets,3.1A Dual USB Ports w/ Car Cigarette Lighter Cable&Alligator Clips Cable,DC12V to AC110V,for Laptops,DVD players,Music Players,Cell Phones,Tablets-8093  
by ERAYAK  
★★★★★ 11 customer reviews

Price: \$36.99  
Sale: **\$29.49** ✓Prime  
You Save: \$6.50 (18%)

In Stock  
Want it tomorrow, April 14? Order within 4 hrs 25 mins and choose One-Day Shipping at checkout. Details  
Sold by eRayak and Fulfilled by Amazon.

Size: 300-Watt

300-Watt <b>\$29.49</b> ✓Prime	400-Watt \$33.99 ✓Prime	500-Watt \$40.99 ✓Prime
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- Two Grounded 110V AC outlets provides 300W continuous sufficient power.
- Dual Intelligent 3.1A USB ports with IR-charge Tech, strong compatibility, auto detects your device
- Full Protection Over voltage,Low voltage,Overload,Short circuit,Over heat,polarity reverse protecti
- Dual external 25 amps Fuse; Built-in cooling fan; Led light indicates working status; Power switch
- Intuitive LED indicators provides visual working status

Roll over image to zoom in

Customers Who Viewed This Item Also Viewed

Page 1 of 8

Share

Qty: 1

Add to Cart

1-Click ordering is not available for this item.

Ship to:  
David Sieg- Urbandale

Add to List

Have one to sell? Sell on Amazon

iClever® 3-Port 6.6A Smart USB Car Charger

iClever BoostDrive Premium USB Car Charger 36W / 7.2A, 3 Ports with S...

★★★★★ 326  
\$74.99 \$11.99 ✓Prime

Ad feedback

Figure out ahead of time how many watts the devices you want to hook up will be using. You can usually find these on the bottom listed with the "UL Label" or you can look it up on the company's website.

If you want an absolute dead simple way to determine wattage, you can buy a "Kill A Watt" meter off of Amazon for \$19.

[http://www.amazon.com/P3-P4400-Electricity-Usage-Monitor/dp/B00009MDBU/ref=sr\\_1\\_1?ie=UTF8&qid=1460563016&sr=8-1&keywords=kill+a+watt](http://www.amazon.com/P3-P4400-Electricity-Usage-Monitor/dp/B00009MDBU/ref=sr_1_1?ie=UTF8&qid=1460563016&sr=8-1&keywords=kill+a+watt)

# How To Build Solar Panels

The screenshot shows an Amazon product page for a 'P3 P4400 Kill A Watt Electricity Usage Monitor'. The product is a white, rectangular device with a digital display and buttons. The page includes a navigation bar at the top with 'Departments', 'Shopping History', and 'David's Amazon.com'. The main product section features a large image of the device, a star rating of 4.5, and a price of \$19.00 (Prime). Below the product image, there is a section titled 'Want to hire an electrician?' with a link to 'Hire an electrician directly on Amazon'. The page also shows a 'Share' button, a quantity selector, and an 'Add to Cart' button. At the bottom, there is a note: 'There is a newer model of this item:'.

Now that you know what the various components do, in the next lesson we'll hook it all up and start generating some power.

PS...Don't forget you can get personalized coaching at [Off-Grid-Living.com/](http://Off-Grid-Living.com/) For some this is the ideal way to get hands on experience as well as personal attention needed to make this work for you.

## Coming Up Next ...

Lesson #18: "Mounting Your Solar Panels on the Roof"

In the next lesson we'll be going into a number of "Do's" and "Don'ts" when mounting your solar panel on the roof.