

Charge Controller Basics

[0m:0s]



[0m:4s] Hi, I'm Josh Bloom, welcome to another video in the RSP Supply education series. If you find that these videos are helpful to you, it certainly helps us out if you could give us a big thumbs up and subscribe to our channel.

[0m:15s] In today's video we are going to be talking about a common piece of hardware that is used in solar powered setups that allows the energy that is harnessed by the sun to be utilized by the electrical systems efficiently, while also storing energy when needed.

[0m:33s] I am talking about solar charge controllers.

[0m:37s] If you have not already seen our other video in which we discuss the basics of solar powered electrical systems, we will link it in the description below.

[0m:46s] For the purpose of this video, we want to focus specifically on the brains of the system, which is the charge controller.

[0m:54s] We will talk about what the main function of the charge controller is,



[0m:59s] and how they work and why they are used. As always, the information in this video is intended to provide only a basic overview of this topic. And should never take the place of proper electrical instruction.

[1m:13s] With that said, let's take a look at what a charge controller is and how they work.

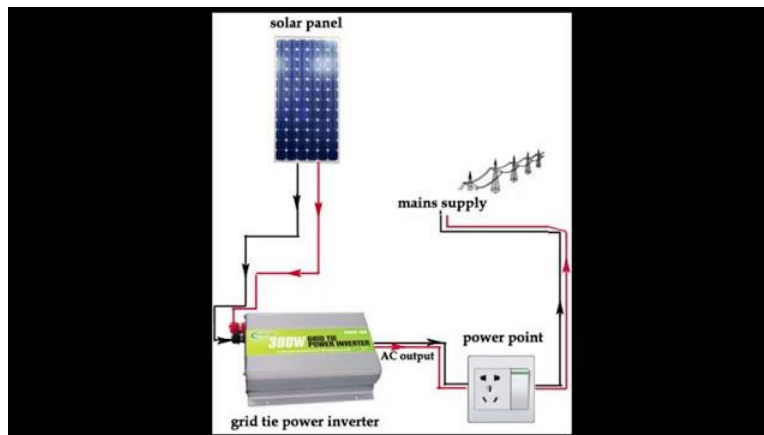
[1m:18s] Let's briefly go over the components of a solar powered setup so that we might better understand where the charge controller fits into the equation. Most industrial solar setups consist of the solar panels which actually capture the sunlight and convert it into energy.



[1m:35s] They only convert that energy during the day, so if power is needed at night or when the sun is blocked by clouds batteries also need to be used. The batteries provide power during nighttime and when the sun is blocked by clouds. Also, depending on the power requirements that are needed,

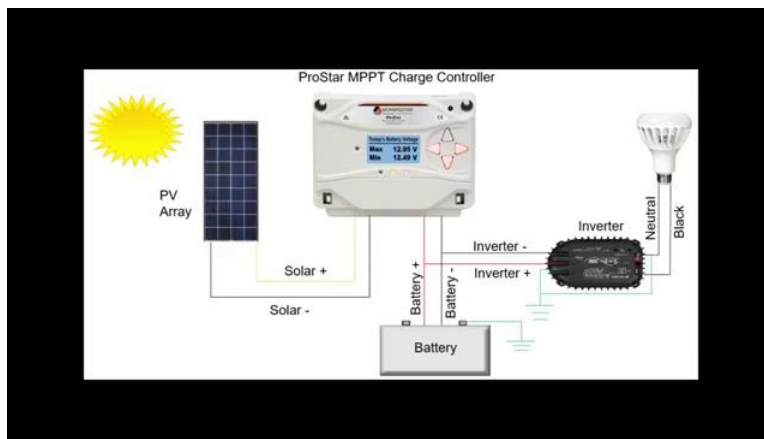


[1m:54s] the use of an inverter, which will convert the DC power to AC power might also be needed. With that said, how is it determined when power is being provided to the solar panels or to the batteries. What happens when the batteries need to be charged? But the electrical load also requires power.



[2m:15s] This is where a charge controller comes into play.

[2m:18s] The charge controller is designed to manage the power that comes from the solar panels and distribute that power to the different loads that need it. depending on the complexity of the charge controller, it may perform other functions, but its most basic function is to manage and direct power where it is needed in your particular system. Let's use an example to better illustrate how a charge controller functions. Let's assume you have two solar panels wired in Series providing 24 volts of DC power.



[2m:53s] The electrical load in this case is a small PLC, a radio, and Ethernet switch used for communication.

[3m:0s] This is a common remote SCADA setup you might see in many different industrial scenarios.

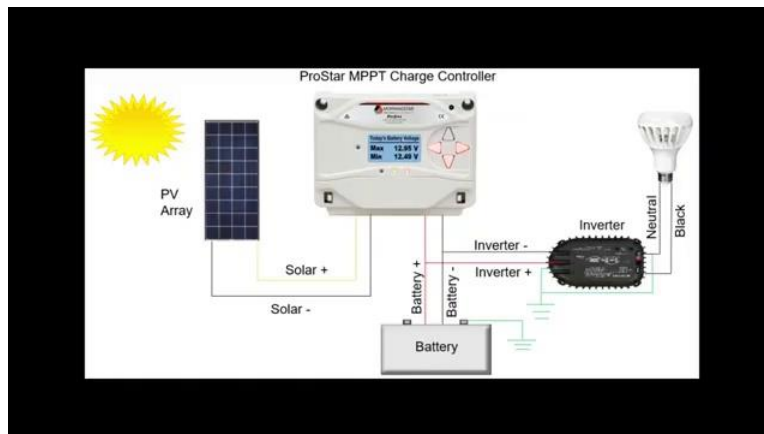
[3m:7s] In this example, let's assume it is important to keep this site running day and night. In order for this to happen, batteries must be used to provide power at night or when the sun is blocked by clouds. The size of the batteries will depend on the load and how long you want to have emergency standby power for your system.



[3m:28s] In this scenario, we need to make sure that the batteries stayed charged, but also to make sure that the electrical components in the cabinet do not run out of power as well.

[3m:39s] The charge controller will handle this function.

[3m:42s] It has the ability to monitor the amount of charge in the batteries and keep them charged while also providing power to the electrical load.



[3m:51s] So, during the day, the charge controller might be sending all of the power from the solar panels to the electrical load

[3m:59s] and none to the batteries, or it may be sending some directly to the electrical load and some to the batteries so that they can charge.

[4m:8s] It all depends on the needs of your particular system.

[4m:12s] At night, the charge controller will detect no power coming from the panels and redirect the battery power to the electrical load to keep the components running as expected.

[4m:24s] Without a charge controller, this type of control in your solar setup would not be possible. Charge controllers are essential to enable proper solar power to any electrical load especially when batteries are being used and the load requires power at night. With some basic understanding of how these devices work and how they can be used, you will be able to ensure that your solar powered setup functions safely and as expected. For a full line of charge controllers as well as thousands of other products please go to our website. For more information or other educational videos, go to RSPSupply.com, the Internet's top source for industrial hardware. Also, don't forget: like and subscribe.

