CHOOSING A SOLAR REGULATOR:

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First and foremost, cheapest is not best. There is a plethora of cheap, mass produced, solar charge controllers (Regulators) on the market, ranging from $12 up to $30. Whilst some of these work ok, they are not going to give you a good service life and/or the max power available. Always try and buy quality over price.

We sell a number of regulators on our site and aim to satisfy all ranges. Once again, the lower priced regulators work ok, however from $30 onwards you can expect longer service lives and more efficient power production/conversion.

Solar controllers are used in between the solar panel and the battery.
Most of today's 12 volt solar panels come in 16-22 volts double for 24volt panels, and obviously batteries are 12 volt. The controller stops the panel from pumping in over charge and regulates the flow whilst allowing for faster or more volts when the battery is low, and slower or less volts as it fills. They then hold a "float" to keep the battery topped up.
Most these days also have USB ports to charge devices at 5volts (USB Voltage) and a spot for a 12 volt accessory.
The 2 main types are listed here.

PWM
PWM Stands for Pulse Width Modulation, and is the most popular of today's modulators mostly due to price.
Unfortunately there is a huge amount of cheap mass produce models out there, and whilst we do provide some of these models, they are from manufacturers we trust, and they are tested by us prior to putting on the market.
A PWM regulator is not as efficient as a MPPT (more below), losing up to 30% efficiency, but it does the basic functions of a regulator in keeping the battery full, or charging as necessary, thereby extending the service life of your battery.

MPPT
MPPT stands for Maximum Power Point Tracking. MPPT regulators are more efficient and allow additional unused voltage to be converted into amps, therefore charging your batteries faster and using all available voltage from the panels, without damaging the batteries.
An MPPT will also allow you to use a panel at 36 volts to charge a 12 volt battery. The same cannot be said of a PWM.
There is a trade-off in the MPPT's price with a genuine MPPT being in the $100's.

HYBRID
The third type of regulator you are likely to see is a hybrid of the two. Whilst they are not a true MPPT and cannot be used on higher voltage panels, such as a 36V, they are 10-20% more efficient in power production ~~on~~ than a PWM, and they are priced mid-way between the two. Hybrids nearly have the power generation of a true MPPT, with the abilities of a PWM.

How to “Size” your solar panels system for a regulator.
These are the basic math conversions and assumes you have the proper 12 or 24-volt panels and batteries combined.

PWM AND Hybrid Sizing:
Note the Voltage of your panel or panels (they should be matched). This is the max solar power available remembering 12 volt panels come in 16 to 22 volts i.e. 19V.

Note the maximum watts of all panels connected i.e. 2 x 80 watt panels is 160 Watts.

Take the watts and divide by the volts, for our example it’s:
160W/19v = 8.42A – (W/V=A)
So the regulator that you require needs to be able to handle amps of 8.42 i.e. a 10 Amp Regulator.

Please note although solar panels may be 12 or 24 volts you cannot use 12/24 to work out the amps, anyone giving this information is either misinformed or does not actually know.

MPPT Sizing:
MPPT sizing is slightly different.
Solar Panel max volts i.e. 19v
Note the maximum volts of your solar i.e. 2 x 120Watts
Note the maximum Battery voltage (12volt AGM is 14.4v)

240W/14.4V = 16.66A
You will need a regulator that handles 16.66, so a (20A) MPPT regulator that also handles the voltage of your panels, i.e. 19V.
And once again the panels should be matched.

Please note for peace of mind there should be a fuse in the system between the battery and the solar regulator, between the regulator and solar panel, and also between the battery and the items running off of that.