

Solar-recharged UPS as a low cost AC power supply for Electronics and Environmental Education

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Uninterruptible Power Supplies (UPS) are a simple and inexpensive protection against mains failures for computers and many other electronic systems. These devices contain almost all the elements required (battery, charger and inverter) to make a portable mains supply that can be recharged by many sources like solar photovoltaic energy, wind energy or hydro-electric power. If any of these sources is not available, it could be removed and recharged with a car battery or an ordinary ac socket.

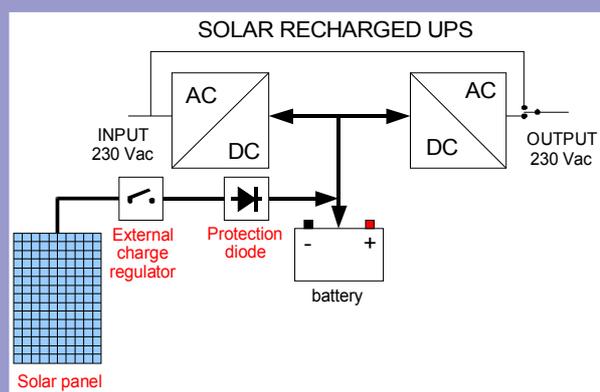
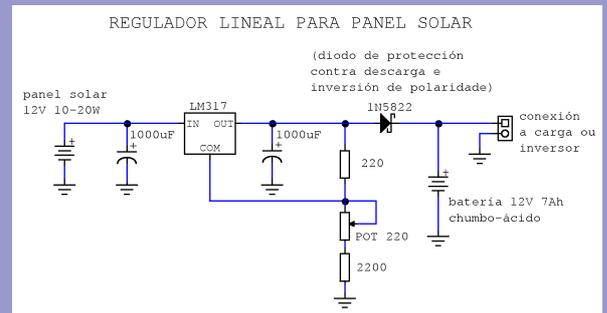
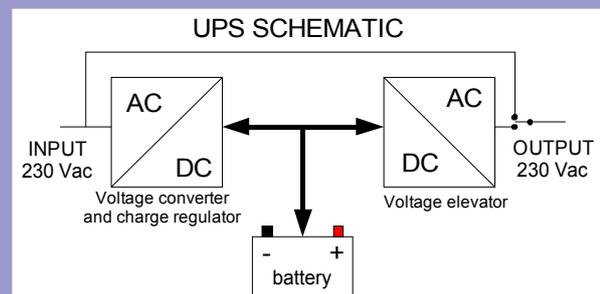
Some external elements must be added, like a solar photovoltaic panel, a charge regulator and protection elements. The following changes have been applied to allow solar recharging:

- An external connector must be installed and connected to the battery to allow access and recharging.
- A solar panel and external regulator must be connected directly to the battery. The solar panel should provide at least 14V and 10-20W of peak power. The regulator can be a commercial type or a self-made one.
- A protection diode must be inserted between the battery and external regulator.

The system can be used wherever there is need for ac power with low consumption, like lighting in small isolated houses, camping, powering of small electronic devices like tv or radio transmitters, etc.

An important field of application is electronics students training, since these students can both make the system elements (like the regulator or connectors), and use them as a solar energy practice.

Students of other fields can also take advantage of this system due to its low cost, like in subjects related to environmental themes.



External self-made regulator circuit



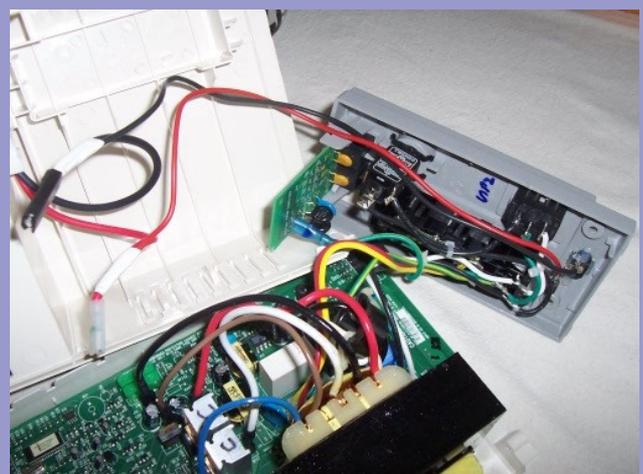
Regulator assembly



Solar panel input



Solar Panel and UPS



UPS connections and changes