

# Solar Inverter

## ***Introduction to Solar Inverter:***

We see many people using Solar inverters these days which proves that its necessity has been increased in the current years. A Solar inverter is similar to a normal electric inverter but uses the energy of the Sun i.e. Solar energy. A solar inverter helps in converting the direct current into alternate current with the help of solar power. Direct power is that power which runs in one direction inside the circuit and helps in supplying current when there is no electricity. Direct currents are used for small appliance like mobile e phones, MP3 players, IPod etc. where there is power stored in the form of battery. In case of alternative current it is the power that runs back and forth inside the circuit. The alternate power is generally used for house hold appliances. A solar inverter helps devices that run on DC power to run in AC power so that the user makes use of the AC power. If you are thinking why to use solar inverter instead of the normal electric one then it is because the solar one makes use of the solar energy which is available in abundant from the Sun and is clean and pollution free.

Solar inverters are also called as photovoltaic solar inverters. These devices can help you save lot of money. The small-scale grid one have just two components i.e. the panels and inverter while the off grid systems are complicated and consists of batteries which allows users to use appliances during the night when there is no Sunlight available. The solar panel and the batteries that are placed on rooftops attract Sun rays and then convert the Sunlight into electricity. The batteries too grab the extra electricity so that it can then be used to run appliances at night.

## **Working of Solar Inverter:**

Now after knowing what a solar inverter is, let's talk about its working. Solar panels produce direct electricity with the help of electrons that are moving from negative to positive direction. Most of the appliances that we use at home work on alternative current. This AC is created by the constant back and forth of the electrons from negative to positive. In AC electricity the voltage can be adjusted according to the use of the appliance. As solar panels only produce Direct current the solar inverter is used to convert the DC to AC.

An inverter produces square waves or a sine wave which can be used for running lights, televisions, lights, motors etc. However these inverters also produce harmonic distortion. Expensive inverters make use of lots of steps to produce a sine wave and thus are found in residential solar inverters. Basically inverters should be a large one so that it supplies enough power to all the necessary appliances.

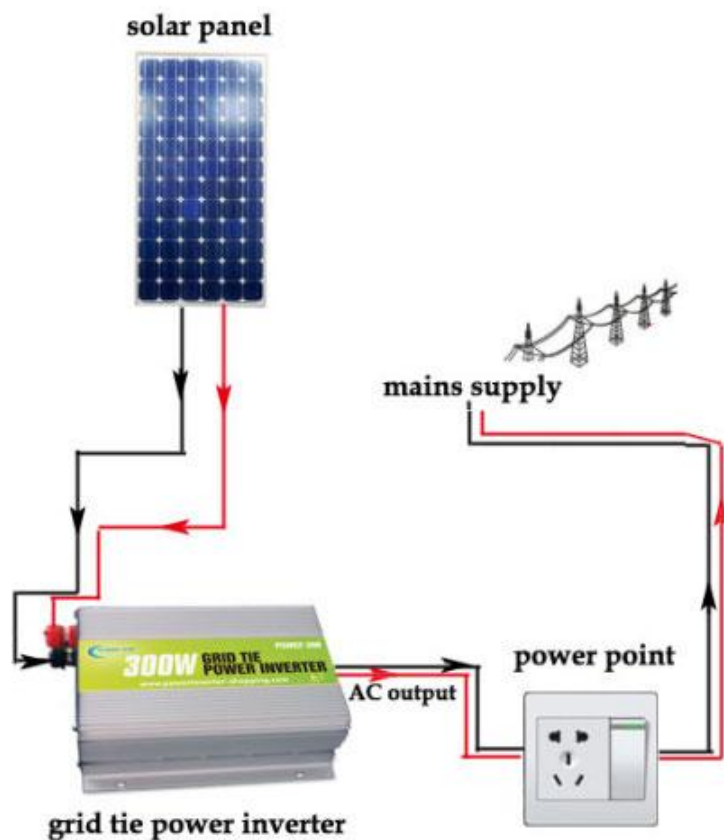
An inverter s easy to buy but choosing the right solar inverter for your appliance is more important. Thus you must always consult a solar professional before buying on. We know that the energy derived from sun is solar energy which is one of the cleanest sources of energy. Also it can be used to provide lighting to houses.

You can make us of the photovoltaic tiles that attract energy from Sun and converts it into a clean form of electricity which can be used to light, houses, industries and companies. The cells of photovoltaic consist of positive and negative silicon that is placed underneath a slice of glass. When the protons of the Sunlight hit the PV cells they knock the neutrons present in the silicon. Now the negative charged neutrons get attracted to the silicon but then are held inside a magnetic field. The wires attached on the silicon catch hold of these neutrons and while connecting to the circuit, current is formed. This then gives space for direct electricity and for converting that into alternate electricity an inverter is used so that the house appliances can run. As mentioned before major of the house appliances work on alternate current hence an inverter is used to convert DC to AC.

Solar power apart from making your home appliances work can also be used to heat water and swimming pools too.

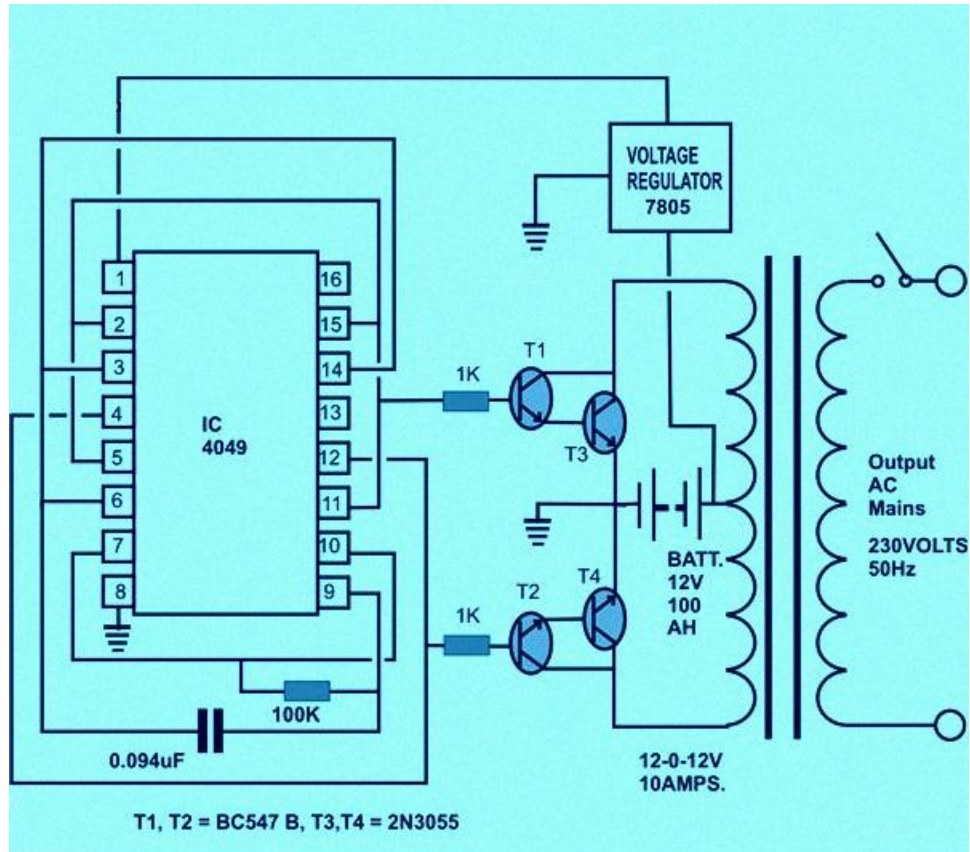
## How to Make a Solar Inverter?

The energy derived from Sun is a renewable one and is totally free of cost. We have learnt how the solar inverter helps in providing electricity and now we shall learn how a solar inverter is made. A solar panel is capable enough to convert the heat or energy of the Sun into direct current.



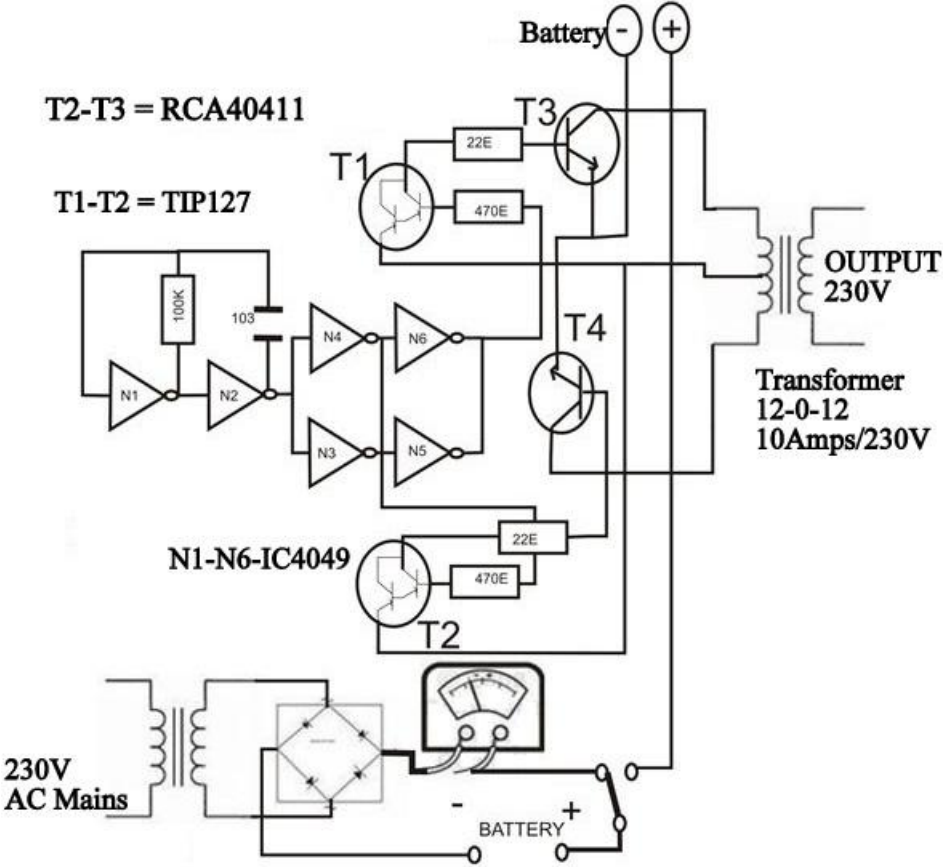
### *Solar Inverter Design:*

To easily understand the construction of a solar inverter lets discuss the following construction sample:-



1. According to the circuit diagram initially do the assembling of the oscillator part which consist of the small components & IC. It is finely completed by interrelating the part leads itself and fusing the joints.
2. Now place the power transistors into the acutely pierced aluminum heat sinks. This is crafted by cutting aluminum sheet into specified sizes and bending their sides, so that it can be hold tightly.
3. Make use of mica isolation kit to fix transistors in the aluminum heat sink, evade short circuiting & direct contact of the transistors from ground & each other.
4. Fasten the heat sink congregation to the bottom of a properly ventilated, strong, thick gauge metal enclosed space.
5. Also fasten the power transformer next to the aluminum heat sinks by making use of screw & bolts.
6. Now join the suitable points of the assembled circuit board & power transistors on the aluminum heat sinks.
7. At last connect the power transistor's productions to the subsequent winding of the power transformer.
8. End the assembly by fastening and interlocking the outer electrical fittings such as switches, mains cord, fuses, sockets, and the battery inputs.
9. A voluntary solar power supply circuit and a transformer may be added within to charge the battery when necessary (check diagram).

# Solar Inverter Circuit Diagram:



To understand well how to construct a solar inverter, it is vital to study how the circuit operates through with the help of following steps:

- N1 & N2 gates of IC 4049 are employed as an oscillator. It carries out the key role of providing square waves to the inverter division.
- N3 to N6 gates are employed as buffers so that the circuit is not dependent on load.
- Continuously changing voltage from the buffer phase is useful to the bottom of the current amplifier transistors T1 & T2. These transistors perform in harmony with the practical changing voltage and boost it to the bottom of the output transistors T3 & T4.
- These producing power transistors swing at a full oscillation, providing the total battery voltage.
- This energy produced is from solar panel & is employed to power the output load.

# Solar Inverter Advantages:

After knowing in detail what a solar inverter is and how different useful it is to make appliances work at residential and industrial levels we must discuss about the many advantages of the device.

- Solar energy has always helped in reducing global warming and green house effect.
- Also use of solar energy helps in saving money many people have started using solar based devices
- A solar inverter helps in converting the Direct current into batteries or alternative current. This helps people who use limited amount of electricity.
- There is this synchronous solar inverter that helps small homeowners and power companies as they are large in size
- Then there is this multifunction solar inverter which is the best among all and works efficiently. It converts the DC power to AC very carefully which is perfect for commercial establishments
- This inverter is cost effective i.e. less expensive than generators
- Apart from solar inverters there are other devices too that make use of solar energy namely, solar cooker, heater.
- Solar inverters are the best way and they are better than the normal electric ones. Also their maintenance does not cost much money

### ***Solar Inverter Disadvantages:***

- Initially you need to shell out a lot of money for buying a solar inverter
- It will work effectively and produce direct current only when the Sunlight is strong.
- The solar panels that are used to attract Sunlight requires lots of space
- The device can work efficiently only if the presence of the Sun is strong.
- Solar Inverters can work when there is no Sunlight but provided their battery is charged fully with the help of Sunlight.

After counting on some of the disadvantages of solar inverter we can state that when a device is very useful at some point of time it too requires proper maintenance and when it comes to a solar device the equipment of solar energy is must. So buy a solar device only if you have plenty of solar energy available.

Source: [www.electronicshub.org/solar-inverter/](http://www.electronicshub.org/solar-inverter/)