

## **Buying guide – INVERTERS**

### **Introduction**

An inverter is basically a device that converts DC (Direct current) into AC (Alternating current). The inverter is brought into play during outages and other power emergencies. The inverter is used for running various types of household appliances, such as microwave ovens, computers, printers, televisions, power tools, and even cars, among many other gadgets. The inverter is powered with a 12 Volt or a 24 Volt battery. Sometimes more than one battery is wired in a parallel configuration. The AV appliance is connected to the inverter for getting the power. Inverter batteries need to be recharged after a period of time. Recharging a battery is done in various ways. The inverter batteries can be recharged either by using a gas generator, activating solar panels, or using an automobile engine. The batteries cannot be recharged independently. Using an extension cord going into the house, electrical devices can be connected.

### **Working of an inverter**

Considering the task it is supposed to perform, the working of an inverter is surprisingly simple. As mentioned earlier, inverters convert DC to AC. DC flows from the positive electrical pole to the negative electrical pole in an uninterrupted manner. AC moves to and fro between the poles. Since most natural electrical circuits are DC circuits, the inverter is needed to convert this DC into AC that is required by many electrical devices.

In order to understand how an inverter works, we should get an overview of the two parameters around which the inverter functions - wave output and wattage output. Wave output is concerned with the movement of electrical signals across an oscilloscope. The physical description of the wave is of paramount consideration. Most inverters use sine wave output. Nowadays, some car power inverters and inverters used in power tools employ the soft start technology (SST) that makes for a gradually increasing voltage to prevent a sudden or 'jerky' start to the tool.

The inverter performs its function through a transformer. A primary winding is linked to a secondary circuit. The centre tap of the primary winding connects the DC power to a transformer. A switch swings to and fro to permit the current to follow alternating paths from one end of the primary winding to the other. This alternating mode of current flow results in alternating current (AC). An electromagnet is used to keep the switch swinging to and fro.

### **What to look for in an inverter**

Finding the correct inverter for your requirements can be made easy by following some of the parameters that need to be considered when buying an inverter.

#### **1. Inverter type:**

Power inverters are available in two main types - Pure Sine Wave inverters and Modified Sine Wave inverters. These two types of inverters can be differentiated from each other by the properties of the waveform generated when the inverter converts DC into AC. Pure sine inverters along with a high-end switching circuitry make for better accuracy when providing power to the various household devices.

Depending on your specific needs, you should choose the inverter most applicable to you. Pure sine wave inverters can be used with appliances such as heaters or toasters. These inverters can also be used with medical equipment, electronic timing devices,

switchmode battery chargers, or induction motors. Pure sine wave inverters are also used for sensitive scientific research apparatuses. Other applications of sine wave inverters include digital clocks, laser printers, variable speed motors and gadgets that work on timers.

Modified Sine Wave inverters are usually more cost effective as compared to pure sine wave inverters. These types of inverters are great for devices that have in-built power adaptors such as chargers and laptop computers.

## **2. Inverter size:**

The choice of the inverter size depends on the wattage of all the electrical devices that need to be connected to the power inverter as well as the maximum number of devices that need to be connected to the inverter at any point of time. The combined wattage of all the devices would need to be supported by the inverter.

Another parameter to be considered is the continuous rating needed for the inverter. Suppose if the combined wattage required by all the devices connected to the inverter is around 1400 to 16000 watts, acquiring a 2000 watt continuous or 4000 watt peak performance inverter would be ideal.

## **3. Inverter rating:**

Inverter wattage rating is generally of two types - peak load rating or top continuous load rating. Peak rating is the maximum wattage offered for the time required to start an appliance. Top continuous rating is the top wattage available for a prolonged duration of time. Generally, an inverter offering Peak load rating is preferred as these kinds of inverters are known to have a long life and are also more consistent in performance.

## **4. Battery:**

It is the battery that plays an important role in determining the performance of the inverter. Therefore, it is advisable to check the battery specifications too when deciding on the inverter to purchase. Generally, the size of the battery is determined by the wattage load and the projected runtime. Using a battery that is not strong enough can cause the inverter not to power up and may lead to discharging issues that could permanently damage the battery.

The formula mentioned below can be used to calculate the battery size:

Inverter rating in watts ÷ input voltage x usage time (hrs) = Battery size.  
e.g. 300W ÷ 12V x 5 hours = 125 Amp

Some other useful formulas that could come in handy when purchasing the inverter are mentioned below:

To Convert AMPS to WATTS:

Multiply: AMPS X 120 (AC voltage) = WATTS

The result is a ballpark figure of wattage required for continuous load of device.

To calculate approximate Startup Load:

Multiply: WATTS X 2 = Starting Load

The result is a ballpark figure of wattage required for starting load of devices, nonetheless few devices might require more starting load.

For Example: Induction motors such as air conditioners, refrigerators, freezers and pumps may have a start up surge of 3 to 7 times the continuous rating.

Formula to convert AC Watts to DC Amps:

AC Watts divided by 12 x 1.1 = DC Amps

Continuous rating:

Maximum combined wattage + 20%.

### **Making the right decision**

After going through the information mentioned in this buying guide, you should have a fair idea of what is required when going in for an inverter. For further information and a comparative study of the various inverters on the market we recommend you visit websites such as [www.etrronics.com](http://www.etrronics.com). Another parameter to be considered when buying an inverter is the after-sales service offered by the manufacturer as well as any warranty the company offers.

In order to get a good deal, as far as both quality and pricing are concerned, purchase your inverter from a reputed brand such as [Pyle](#). You can view some quality power inverters that suit your budget at the following link: [\\$50 - \\$100](#).