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Solar panels produce electricity as direct current (DC). Almost all household appliances such as fridges, wifi routers and TV"s run on alternate current (AC), however. Solar inverters convert the direct current (DC) energy from a solar panel into alternate current (AC) energy appliances use.

It"s also important to note that solar batteries store DC energy. Before you can use the energy in a battery to power an appliance, it has to be converted to AC energy using an inverter.

The distinctive feature of a grid-tied or "grid-direct" inverter is that they shut down when there is no electricity from the utility. This means the solar system shuts down when there is load shedding or a power outage.

An off-grid inverter is used in a stand-alone or off-grid solar system where there is no grid-supplied electricity. These inverters are ideal for game lodges, rural areas or new homes that do not have utility supplied electricity.

Unlike grid-tied inverters hybrids do not shut down during load shedding or a blackout. Rather they disconnect from the grid and continue supplying electricity.

A sine wave or waveform is the quality of the current signal an inverter sends to an appliance. Think of it as the “broadcast frequency” of a current. Sine wave is important because some appliances will not function properly with some inverters because of the sine wave.

Pure sine wave is the recommended waveform for inverters because it closely matches the waveform of electricity from the utility. This is critically important if you want to sell electricity back to the grid through net metering. Most modern inverters are pure sine wave.

A modified sine wave is cheaper but produces a lower quality waveform that might affect how your appliances work (poor picture quality on your TV for example). Because it is a lower quality waveform, you might not be able to export electricity to the grid.

Square wave inverters are the least used in solar power systems. This is because they also produce a lower quality waveform that might not work with your appliances.

These measures are supplied by the manufacturer and are important in designing a solar energy system. Exceeding the maximum voltage or power rating of the inverter will damage the inverter. If the voltage or power is below the minimum rating, it will not function at all.

Peak power rating or surge power is the maximum amount of power an inverter can produce for a short period

usually when an appliance like a refrigerator starts up.

Getting an inverter with a bigger power rating (up to 30%) than what you need is considered good practice. This gives you flexibility should you need to expand your system in the future.

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