SunWize Power & Battery

What's So Special about a Solar Battery?

Regular deep-cycling requires rugged construction

The battery bank is one of the key components in a solar electric (photovoltaic or PV) system. Since power generated by the solar array is intermittent, the battery bank must provide continuous power to the load equipment.

SunWize® Power Station for cathodic protection. The PV array shades the battery enclosure..

The battery does a lot in a PV system:

- power the load 24/7
- accept daily charging by the PV array
- experience daily discharging when power from the PV array is less than the power required by the load

Since the power coming from a PV array is a valuable commodity, the battery not only has to perform the 3 functions stated, but also has to do them with the greatest possible efficiency in order to maximize the use of that power.

For these reasons SunWize takes the battery selection process very seriously. We use only high-quality SOLAR batteries that are designed specifically to "take care of business" by handling the functions noted with great efficiency.

Solar Battery Operation and Construction

Batteries in a PV system that are subjected to daily charging and discharging, operation in daily temperature extremes and low discharge rates, are constructed with materials that make it well-suited to that type of operation. Batteries used for an entirely different purpose, such as starting a car, are specially built for that operation.

SunWize Power Station. battery bank placed in shaded battery enclosure.

The construction features of a PV battery are different than those of an automotive battery. Yet, we find examples where automotive batteries are used in PV systems with poor results.

A primary factor in the construction of a rugged PV system battery is the positive plate. Cycling a lead-acid battery puts significant stress on the lead material within the positive plate. PV batteries modify the positive plates by increasing the cross-sectional dimension of the plate and by adding alloys to the lead to strengthen the plate.

These modifications, while limiting the short-term current flow (starting current or cold-cranking amps), give the plate the ability to successfully withstand the stress in a typical PV system over years of operation.

Automotive Battery Operation and Construction

Automotive batteries are on the other end of the spectrum. They deliver a large amount of current for a very short amount of time, after which they are rapidly recharged by the car's charging system. Beyond these functions, automotive batteries sit idle for a majority of their operating lives. The positive plate in these batteries is a soft lead-calcium with a thin plate cross section. It is very effective at producing a lot of amperage for a short period, but has no ability to perform over a long period if subjected to the daily cycling of a PV system.

Use the Right Battery for the Right Application

In summary, what we see are rugged, deep cycle PV batteries operating with great charge and discharge efficiency over many years of service at a remote equipment site. Automotive batteries do an excellent job of starting cars, also over many years.

SOLAR BATTERY	AUTOMOTIVE BATTERY
Higher initial price	Lower initial price
Designed for deep cycling	Designed for engine starting
Low current flow over long time period	High current flow in a short amount of time
Thick lead plates	Thin lead plates
Can undergo significant mechanical stress, good for deep cycling	Cannot withstand repeated deep cycling
Degrade slowly	Degrade faster

What we want to avoid is "crossing the streams" by placing automotive batteries in a PV system where their plate construction will not survive the rigors of daily cycling, giving the battery a very short operating life measured in months, not years.

A PV battery may be more expensive up front, but it will prove itself hands down as the more cost-effective solution over the long life of the PV system.

Corporate Headquarters
1337 Main Street, P.O. Box 895, Philomath, OR 97370
1.800.827.6527 | power@sunwize.com | www.sunwizepower.com