

Phoenix Contact

Solar Power Terms

-A-

AGM -- Absorbed Glass Mat, a newer type of battery construction that uses saturated absorbent glass mats rather than gelled or liquid electrolyte. Somewhat more expensive than flooded (liquid), but offers very good reliability.

ampere-hour (Ah)--Quantity of electricity or measure of charge. How many amps of flow or which can be provided over a one hour period. Deep cycle batteries used in solar power systems are rated in Ah (amp-hour).

array--Any number of photovoltaic modules connected together to provide a single electrical output. Arrays are often designed to produce significant amounts of electricity.

autonomous system--A stand-alone PV system that has no back-up generating source. May or may not include storage batteries. Most battery systems are designed for a certain minimum "days of autonomy" - which means that the batteries can supply sufficient power with no sunlight to charge the batteries. This varies from 3-5 days in the sunbelt, to 5 to 10 days elsewhere.

-B-

blocking diode--A diode used to restrict or block reverse current from flowing backward through a module. [UL 1703] Alternatively, diode connected in series to a PV string; it protects its modules from a reverse power flow and, thus, against the risk of thermal destruction of solar cells.

-C-

cell--The basic unit of a photovoltaic panel or battery.

charge controller--An electronic device which regulates the voltage applied to the battery system from the PV array. Essential for ensuring that batteries obtain maximum state of charge and longest life.

current at maximum power (Imp)--The current at which maximum power is available from a module. [UL 1703]

cycle life--Number of discharge-charge cycles that a battery can tolerate under specified conditions before it fails to meet specified criteria as to performance (e.g., capacity decreases to 80-percent of the nominal capacity).

-D-

deep discharge--Discharging a battery to 20-percent or less of its full charge.

discharge rate--The rate, usually expressed in amperes or time, at which electrical current is taken from the battery.

-E-

-F-

-G-

gel-type battery--Lead-acid battery in which the electrolyte is composed of a silica gel matrix.

-H-

hybrid system--A PV system that includes other sources of electricity generation, such as wind or fossil fuel generators.

-I-

insolation--Sunlight, direct or diffuse; from 'incident solar radiation.' Not to be confused with 'insulation.' Equal to about 1000 watts per square meter at high noon.

-J-

junction diode--A semiconductor device with a junction and a built-in potential that passes current better in one direction than the other. All solar cells are junction diodes.

-K-

-L-

-M-

maximum power point (MPP)--The point on the current-voltage (I-V) curve of a module under illumination, where the product of current and voltage is maximum. [UL 1703] For a typical silicon cell panel, this is about 17 volts for a 36 cell configuration.

module--A number of PV cells connected together, sealed with an encapsulant, and having a standard size and output power; the smallest building block of the power generating part of a PV array. Also called a panel.

-N-

-O-

-P-

parallel connection--A way of joining two or more electricity-producing devices (i.e., PV cells or modules) by connecting positive leads together and negative leads together; **such a configuration increases the current.**

peak load; peak demand--The maximum load, or usage, of electrical power occurring in a given period of time, typically a day.

peak watts (Wp)--See 'Photovoltaic peak watt.'

photovoltaic (PV) array--An interconnected system of PV modules that function as a single electricity-producing unit. The modules are assembled as a discrete structure, with common support or mounting. In smaller systems, an array can consist of a single module.

photovoltaic (PV) cell--The smallest semiconductor element within a PV module to perform the immediate conversion of light into electrical energy (dc voltage and current).

photovoltaic (PV) panel--often used interchangeably with PV module (especially in one-module systems), but more accurately used to refer to a physically connected collection of modules (i.e., a laminate string of modules used to achieve a required voltage and current).

photovoltaic (PV) peak watt--Maximum "rated" output of a cell, module, or system. Typical rating conditions are 0.645 watts per square inch (1000 watts per square meter) of sunlight, 68 degrees F (20 degrees C) ambient air temperature and 6.2×10^{-3} mi/s (1 m/s) wind speed.

PV--Abbreviation for photovoltaic(s).

-Q-

-R-

-S-

self discharge--The rate at which a battery, without a load, will lose its charge.

semicrystalline--See 'Multicrystalline.'

series connection--A way of joining photovoltaic cells or batteries by connecting positive leads to negative leads; **such a configuration increases the voltage.**

short-circuit current (Isc)--The current flowing freely from a photovoltaic cell through an external circuit that has no load or resistance; the maximum current possible.

solar cell--See 'Photovoltaic cell.'

solar constant--The strength of sunlight; 1353 watts per square meter in space and about 1000 watts per square meter at sea level at the equator at solar noon.

state of charge (SOC)--The available capacity remaining in the battery, expressed as a percentage of the rated capacity.

-T-

trickle charge--A charge at a low rate, balancing through self-discharge losses, to maintain a cell or battery in a fully charged condition.

-U-

-V-

Voltage at maximum power (Vmp)--The voltage at which maximum power is available from a module. [UL 1703]

-W-

-X-Y-Z-