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SolarPower

The Basics of a Solar Electric Power System

Solar systems begin with the solar module. Modules gather solar energy in the form of sunlight and convert it into direct current (DC) electricity. The more sunlight they receive, the more electricity they produce. Solar modules are the heart of the system. They are the power generators.

Components such as charge regulators, batteries and inverters regulate, store, condition and deliver the electricity. Other elements connect the different components of the system.

Solar systems have to meet high standards of reliability and economic efficiency. This can only be guaranteed by the use of field-proven quality components that are well matched.

Defining the Components of a PV System

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Components such as charge regulators, batteries and inverters regulate, store, condition and deliver the electricity. Other pieces such as wires and mounting structures connect the different components of the system. P&R Technologies supplies both components and complete package systems.

- **Sunlight** - Sunlight is energy in the form of light. It is the fuel of a solar (photovoltaic) system.
- **Solar Cell –** A solar cell generates DC electricity directly from sunlight.
- **Solar Modules** - A solar module/panel is a grouping of solar cells. Use one or more modules depending on your power needs and the amount of sunlight available. Solar modules generate DC electricity directly from sunlight. Use one or more modules depending on your power needs and the amount of sunlight available.
- **Solar Array** – A solar array is a grouping of solar modules in series and parallel that produce the power needed by a solar system.
- **Charge Regulator** - Charge regulators are the link between the modules, battery and load. They protect the battery from overcharge or excessive discharge.
- **Battery** - Batteries store the energy generated by the solar modules.
- **Inverter** - Inverters convert DC (direct current) electricity into AC (alternating current) to run many common appliances and equipment.
- **Mounting Structure** - Mounting structures hold the solar modules securely in place. Ground, roof and pole mounting versions are available.
- **Load** - The appliances, lights and equipment being powered are called electrical 'loads'. Energy-efficient loads contribute to overall system efficiency and economy.
- **Wiring / Interconnects** - Proper wiring and connections must be specified for every segment of the system to assure best performance.
- **Generator -** Compatible generators (e.g. diesel) may be used as back-up for excessive power demands or during unanticipated long sunless periods.
- **Space -** Solar modules should be installed in an area that is generally free from shade and receives as much direct sun exposure as possible.
- **Maintenance** - Solar systems are one of the easiest and most reliable ways to generate electricity. Regular maintenance to check wiring, connections, batteries, and overall system condition will help assure long-term trouble-free operation.