

OZTRON Off-grid & Hybrid System, AC Coupled

OZTRON Off-grid Energy System combines Solar PV with batteries provides stable, high quality AC power where electrical grid is not available. Together with a diesel or gas generator it is an economical, continuous, highly reliable source of electricity. Oztron Hybrid Generation System is an industrial grade product, suitable for continuous full load operation. It can be used for:

- Providing AC Power where grid is not available
- Reducing the cost of diesel generation
- Lower cost alternative to Grid extension

Oztron conducts detailed assessment of the requirement and uses professional engineering software for the optimum combination of PV array, battery storage, diesel generator and grid. Systems are individually designed to meet customer requirements.

Benefits

Diesel Replacement

Off-grid users usually depend on diesel generators to provide electricity. Solar Power can reduce the cost of electricity generation to about 50%. Optimum design and smart, adaptive controls would yield the lowest Levelized Cost of Electricity.

Grid Extension or Upgrades

The electricity grid may not be available near the point of use in a rural setting or the existing line may be inadequate for supplying the required load. The cost of extending or upgrading the grid connection can be prohibitive. A Solar-hybrid solution, with or without the grid, can be a far cheaper alternative, while ensuring lower cost of electricity and increased reliability.

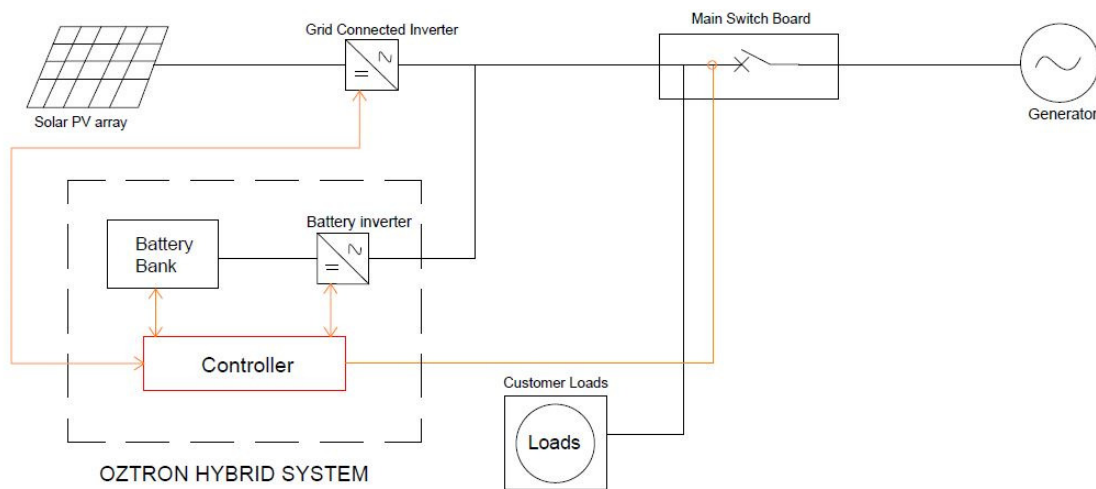
Remote Power

Sometimes high reliability electricity is required in remote, unattended locations. Diesel generation may not be always feasible. A PV-storage combination would be an ideal solution. As battery storage is expensive, choosing the right battery type and size is important. Oztron can provide systems tailored to specific applications and not depend on the cookie cutter solutions commonly offered. This ensures the lowest cost and highest reliability.

Technical Description

The Oztron AC Hybrid System connects to the AC side of a solar PV installation. It consists of the following sub systems:

- PV Array with AC grid connect inverters
- 3 phase bi-directional inverter and high voltage battery stack in a single cabinet
- Battery Management System (BMS), integrated with the Inverter cabinet
- Energy Management System (EMS), integrated with the Inverter cabinet
- Diesel or gas generator with integrated controller
- Larger systems would include external master controller and communications and switchboard.



System size can vary from 30kVA to 1000kVA, depending on the requirement.

The Energy Management System (EMS) continuously monitors the PV, battery, inverter and generator parameters. It provides:

- Control over the battery charging ensuring optimum use, maximum life
- Protections against over temperature, overcharge, over discharge and general malfunctioning
- Control over generator selection, start-stop and loading
- Communication for Remote Control and Monitoring

The EMS can be custom configured to suit different requirements.

Operation

1. The PV Array supplies the load and stores the surplus energy in the battery
2. If the PV-battery combination is sufficient to supply the load, the generator is kept off
3. If PV is low and battery is partially discharged, the generator is turned on
4. The battery charge with generator operation is controlled to ensure uniform, optimum loading on the generator, prevent glazing

For some peaky loads like hoists and hydraulic machines the load can vary from 20% to 120% every minute. This can put severe stress on the generator and increase the fuel consumption. The hybrid system can smoothen these variations and ensure that the generator run uniformly at an optimum load, while reducing the overall fuel consumption.

Construction Features

- Compact design. 30kVA in a single 600mm x 600mm floor standing enclosure
- Only one power connection needed from the storage unit to the distribution board

- Lithium Battery with high charge and discharge capability and long service life
- Modular construction, capacity can be added easily
- Larger systems can be supplied fully assembled in transportable enclosure

Remote Monitoring and Management

All Hybrid Systems come with full remote monitoring and management, being accessed through an external LAN or a Mobile network. It monitors and reports the status, faults, battery condition and system performance. The system can be remotely managed, adjusting the parameters and ensuring optimum operation. The link is also be used for remote troubleshooting and maintenance, including software upgrades.

On-grid Operation

Where a Mains connection is available, the system can be configured to operate interactively with the grid. It will connect to the grid when suitable and disconnect when the grid is out of range or not available.

Microgrid

The Hybrid system can be extended, integrated and managed with other energy resources and loads to make up a Microgrid. For larger installations this is a better and more cost-effective approach.

Microgrid systems are custom designed to suit specific requirements.

DC Coupled Hybrid Systems

For large systems a DC coupled design could have some advantage. It is more efficient and reliable.