Introduction to Grid Tie Technology

Making the Most of Renewable Energy

ENGINEERING YOUR SUCCESS.
What is “Grid Tie”?

- In very basic terms, the concept of “Grid Tie” refers to a connection to the power grid, used to FEED power as opposed to CONSUMING it.
Sounds simple?

- Not really…Unless the generating source matches the grid frequency and is synchronized with the generating utilities, a connection will not be successful…

Generating Utilities – 60 Hertz AC

60 Hertz AC
Enter the Grid Tie Inverter…

- A Grid Tie Inverter system converts generated or stored power to a form that is compatible with the power grid.
What is a Grid Tie Inverter?

- An electric power conversion device used to convert raw generated power in various forms into regulated AC and feed it into the utility grid in a synchronized and controlled manner.
What is a Grid Tie Inverter?

- Applications producing generated AC use two power sections – one to convert the generated AC into DC, and the second to invert the DC back to 50 or 60 Hz AC and feed it into the grid.

- The technical name for a grid tie inverter is "grid-interactive inverter". They may also be called synchronous inverters or Active Front End units.

- Grid tie inverters incorporate a circuit to detect and lock in on the phase angle of the grid power before energizing.

- Some grid tie applications have special requirements like “anti-islanding”, designed to take the unit off line in the event of grid failure, or specific electrical codes like UL1741.
Some Grid Tie Inverter applications

- Wind turbines
- Photovoltaic solar fields
- Wave power
- Energy storage
Parker Energy Grid Tie Division
Products and Systems Offered

- Outdoor duty central inverters for PV solar
- Modular grid tie inverters for wind power generation
- Marine hardened inverters for wave power
- Bidirectional inverters for battery energy storage PCS (power conversion systems)
- Battery Energy Storage Systems
Parker 890 Series Grid Tie Inverter

- The basis of most grid tie systems is Parker’s modular “890” inverter design
- The grid tie inverter can combined with other components and packaged to form a complete system, relevant to the application
AC890PX Grid Tie Inverter

Parker Modular Flexibility

- Field replaceable IGBT phase modules
- Modular inverters can operate in parallel for highest power ratings

Easy plug-in replacement!

No-leak refrigerant/loop connectors

Electrical connections to power bus
AC890PX Grid Tie Inverter

Cool under pressure

- Air cooled ratings use efficient plenum design to maximize cooling while keeping airborne contaminants away from electronics
- Parker Advanced Cooled ratings allow higher power in smaller footprint
- Safe dielectric coolant in hermetically sealed system requires no routine maintenance
Why Parker?

- **EXPERIENCE** – our grid tie inverters are based on a power conversion design that has been used in industry for over 5 years, and the result of 30 years of design evolution within SSD Drives Division.

- **Installations** – Parker EGT is the industry leader in grid tie energy storage applications using lithium ion batteries...over 85 megawatts installed.

- **Flexibility** – We will provide basic inverters, customized designs, or complete turn-key systems.

- **Advanced cooling** – Heat is the enemy of electronics used to convert power, and Parker offers a unique and efficient cooling system...the only refrigerant based system available. Can reduce power conversion size by 66% or more.

- **Industry acceptance** – Parker has a major presence in renewable energy and power generation, and knows the needs of the industries.
Energy Grid Tie (EGT) Division Charter

Parker EGT is a global turn key solution provider and a global center of excellence for Energy Grid Tie power conversion and energy storage systems through our expertise in power electronics, battery energy storage and advanced thermal management.
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