

Industry Profile

Wind Energy Recovery Solutions from Parker – SSD Drives Division



One of the most important processes in any wind turbine installation is the efficient conversion of the variable output of the generator to a form that is compatible with the power grid.

Grid Tie Inverter

Solutions. In a typical wind turbine application, the blades rotate an induction or permanent magnet generator, either directly coupled or through a gear train. The speed of the generator will vary with wind velocity. Parker SSD Grid-tie Inverters effectively capture and smoothly distribute this newly generated power onto the power grid, synchronized to grid frequency at a constant 60 Hertz, regardless of wind velocity. Our inverter design has the ability to control the generator's torque and speed, and will optimize the loading of the generator to produce a constant output under fluctuating wind conditions. Integral harmonic filters

ensure grid compliance by delivering pure sine wave power well within IEEE519 guidelines for Total Harmonic Distortion (THD). The efficiency of the inverter exceeds 98%, and provides a unity power factor. One properly sized AFE can support multiple inverters/generators each connected to the DC bus as one common system.

AC890PX Series. SSD Drives Division of Parker Hannifin Corporation has recently launched the next phase of its highly successful AC890PX family of grid tie inverters. Revolutionary new cooling technology has allowed the product line to reach 2 MW at 690 VAC while still providing the small footprint required for installation in compact spaces. The advanced cooling system uses a non-conductive refrigerant, and is hermetically sealed, requiring none of the maintenance normally associated with a liquid cooled inverter.

Modular and Flexible.

Whether air or refrigerant cooled, Parker's grid tie inverter platform has a unique modular design. Within each inverter, phase modules containing the IGBT devices are individually removable for easy replacement in minutes, at the installation site, and without requiring factory service. The modules weigh under 50 pounds, so can be shipped anywhere in the world, quickly and economically. The complete inverter is also a module of its own, and can be paralleled into configurations to 2 megawatts. To further improve operational flexibility, the AC890PX series can be used with induction or PMAC generators. It communicates via all popular industrial protocols, including Ethernet, Profibus, ControlNet, DeviceNet and CANopen, making it suited to integration into your network.



Complete solutions.

While Parker offers grid tie inverters as modular stand-alone units, some customers prefer a system approach. Systems can include switchgear, transformers, monitoring equipment and displays, and even battery storage modules. Adjustable frequency drives can be added for yaw and pitch mechanisms. Systems can be provided as cabinet line-ups or even pre-wired and installed into a trailer or shipping container for ease of transport and setup on site. In addition to grid tie inverters, Parker manufactures a line of PMAC Generators, which can simplify the turbine system design. By virtue of their high pole count, a direct-drive configuration can be used, eliminating the need for heavy, costly, and failure-prone gear reducers. Direct drive torque motors save space, do not leak, run quietly and



PMAC Generator

are up to 10% more efficient than gear-driven installations.

Other Components. In addition to the grid-tie inverter, Parker Hannifin manufactures quality hydraulic and electromechanical items that are used in many wind turbine designs. Some of these include hydraulic fittings, connectors, hoses, and valves – as well as power units, pumps and motors. In addition, pitch control systems, actuators and braking systems are available.

About Parker - With annual sales exceeding \$12 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems, providing precision-engineered solutions for a wide variety of mobile, industrial and aerospace markets. The company employs approximately 62,000 people in 48 countries around the world. Parker has increased its annual dividends paid to shareholders for 52 consecutive years, among the top five longest-running dividend-increase records in the S&P 500 index.



AC890PX Grid Tie Inverter - Features/Specifications

- Digital, variable frequency inverter with 32 bit microprocessor control to convert output of an induction or PM AC generator to clean grid power.
- Plug-in phase modules slide into rack for virtually zero downtime.
- Latest IGBT device technology for low power loss.
- Built-in UL/cUL approved overload circuit to protect against transient and extended overloads.
- Built-in EMC filtering that meets second environment.
- Backlit LCD keypad, 2 line plain language, for set-up, diagnostics and fault monitoring.
- USB port for drive programming, accessible without opening enclosure.
- Communication card option: Ethernet IP, Modbus TCP, ControlNet, Profibus, Devicenet, CanOpen..
- Programmable Auto-restart feature to start the inverter in case of a trip. Number of attempts and delay for each attempt adjustable
- Process analog input selectable for 0-10V or 4-20ma for transducer compatibility.



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