

UPS solutions for wind turbines: high performance in all weathers



Battery analysis and care system

The performance and profitability of a wind turbine stands and falls with its operational reliability. Any fault or outage can cost the operator dear while also potentially impacting on safety; costly servicing puts an extra strain on budgets. Therefore, it is all the more important for the operator to have full confidence in each individual component. A continuous power supply plays a crucial role in this and UPS systems from AKI Power Systems can provide the security of an Uninterruptible Power Supply – 24/7, in all winds and weathers, in both onshore and offshore turbines

Well-founded expertise for high availability and premium power

AKI Power Systems has specialised in UPS systems for more than 20 years. This expertise has also been brought to bear in the area of wind turbines where absolute availability and enormous resilience and reliability of turbine components are as crucially important as is their maintenance-friendliness. The bar is set particularly high with offshore turbines as these must be able to withstand extreme weather conditions. The specialists at AKI develop solution concepts which are specifically adapted to cater for these complexities.

The company supports operators by offering products and services such as protection devices to ensure that the turbines keep functioning while maintenance is carried out, energy saving monitoring, day and night availability and servicing.

As the UPS system supplier for the REpower 5M for the past five years, AKI Power Systems has already proven its reliability by passing the biggest load test in the wind power market. With a rotor diameter of 126 metres and a rated output of five megawatts, the 5M is the most powerful wind turbine in the world. The experience which the company has gained by implementing UPS systems in many different situations, dealing with both onshore turbines and offshore wind parks, will form the basis for the safe handling of future challenges.

Round-the-clock efficiency and reliability

Ensuring a continuous power supply, whether it be for central control tasks or for safeguarding a wind turbine, is one of the greatest challenges for any offshore project. Here is just one practical example: positioning lights and rotor warning lights must have continuous power as they signal the location of the turbine thus preventing ships or aeroplanes from colliding with it. Disastrous consequences could ensue if one of these lights were to fail.

Proper monitoring of the wind turbine by the central control unit also calls for a permanent power supply. Ultimately, it relies on the continuous transmission of data from its sensors for the efficient and safe operation of the turbine, data such as the wind strength and direction, measurements of shocks and vibrations, data for the optimum control of the rotors, for monitoring self-contained batteries and the internal and external temperature.

AKI Power Systems provides reliable power sources for devices and components within a wind turbine in order to ensure that all of these tasks can be carried out reliably.

Highly available turbines – completely in their element

When designing and implementing a “made-to-measure” UPS solution, it is not only the whole area of protection that must be considered but also the peripheral devices and components. Both the components and the materials used must be able to withstand the extreme conditions at sea.

All UPS solutions from AKI Power Systems are based on this integrated approach. All items for use in offshore wind turbines are protected from the corrosive effects of damp, salty sea air. High shock and vibration resistance is also a given. The compliance of all components with the IP 23 standard (protection from permeating rain and spray at an angle of 15°) is another essential element of the solutions.

Quick maintenance, great savings

The maintenance-friendliness of an offshore wind park has a particularly big influence on its profitability. As it can only be reached by boat or helicopter, the costs for carrying out a service at sea can quickly rise to €30,000 or more.

AKI Power Systems’ UPS modules are designed with this situation in mind. For example, the battery life is checked by an integrated Battery Analysis and Care System (BACS). An electronic monitoring system ensures that each individual battery cell is only charged when this is required. This dispenses with the automatic charging and discharging of all batteries, increasing the length of use of each battery by 30%.

The entire process can be monitored remotely, conveniently and reliably. The web manager sends the relevant data to the control centre, giving the operator an overview at all times of the charge state of the batteries and making it possible to pinpoint whether batteries will need to be replaced at the next service.

Another plus is that thanks to sophisticated withdrawable-unit design, individual UPS modules can be replaced quickly and conveniently. All power and communication lines are simply inserted into one another, sparing the need for complex component expansion or dismantling at dizzying heights.

Furthermore, UPS systems for wind turbines are “craneable”. They are equipped with a non-warping, non-distorting casing and special eyelets for this purpose, making it possible for them to be lifted by crane into the nacelle.

All UPS systems from AKI Power Systems are designed to ensure that maintenance work can be carried out simply and safely, thus facilitating considerable cost savings.

Customised expertise for high availability

No two wind turbines are the same and an “off-the-shelf” solution just won’t cut it in the area of UPS systems. Each wind turbine requires its own individual concept which will precisely accord with its performance and location requirements. Therefore, the experts at AKI Power Systems develop a customised solution concept for each turbine.

With safety requirements also high, AKI Power Systems can offer individual solutions for protecting computers and data, production machines and systems.

Its services include:

- UPS systems in various sizes and with various performance levels
- Protection from excess and low voltage, phase and neutral wire failure, neutral point displacement, short circuits and residual current
- Permanent network monitoring
- Backup electric generators
- Voltage stabilisers
- Active filters

Into the future with new energy

The renewable energy market is booming. Extending wind energy use at sea is an area of great potential. Thirteen percent of European energy consumption might even be covered by offshore wind parks by 2030. Wind energy has already got clearly ahead of hydropower in the national energy mix. More than 21,000 megawatts of wind power is already on grid in the Federal Republic of Germany, around 28% of the global wind energy yield. Worldwide statistics put Germany in the lead in this area.

AKI Power Systems, with its future-proof concepts, space-saving, modular systems that grow in line with requirements, and quick cost-effective service, is ideally placed to meet this increasing demand. ■

For more information please email joern@aki-usn.com or visit www.aki-usn.com/windpower/