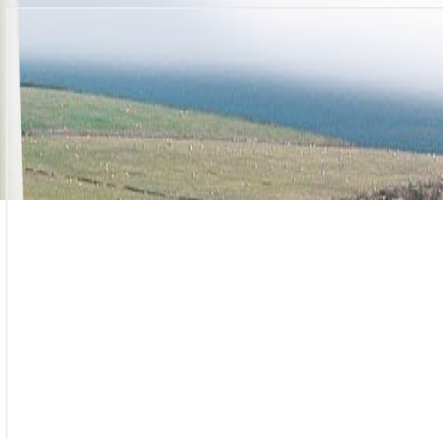


# Wind Power Stations: Controlling and Switching High Currents Safely and Reliably



The demand for energy is constantly increasing all over the world. Recently commissioned power stations primarily use fossil fuels and thus further increase emissions worldwide. To counteract this spiralling trend, many countries are supporting the development of renewable energy sources, and wind power in particular.



**Big in power – small in dimension**

Changing weather conditions and fluctuating wind speeds are the cause of frequent disconnections and reconnections of the generator output with the power supply network. This leads to the considerable wear of the contactor contacts as well as the electrical drives of the circuit-breakers. This is not surprising, since the prime objective is ultimately to switch several thousands of amperes, whilst at the same time complying with the stringent grid compatibility rules of the utility companies.

SEG Schaltanlagen-Elektronik-Geräte GmbH & Co. KG, located in Kempen in the Lower Rhine region of Germany, is the supplier of leading wind turbine manufacturers and uses high-rated contactors from Moeller. Its CON-CYCLE inverter is a major part of the power generating system of a wind power station. As manufacturers of inverters for variable speed and double-fed asynchronous generators, SEG favours Moeller DILM and DILH vacuum contactors. These can switch currents of several thousand amperes up 150,000 times and without any wear.



**Reliability of all components is an absolute necessity**

A wind turbine is an investment of several millions of euros. This investment is only worthwhile if the turbine can supply electricity with as little interruption as possible. The reliability and failsafe performance of all components are therefore an absolute necessity.

Based in Aurich, Germany, Enercon is the second largest supplier of wind turbines in the world. For over ten years it has used Moeller components for all its automation, commanding, signalling, switching and protection requirements. Product quality and the close cooperation with the R & D departments were and still are the key reasons for choosing Moeller as a

supplier. In order to meet the continuously increasing requirements of European grid compatibility regulations for utility companies (such as E.on), Enercon uses high rated contactors that are equipped with an electronic drive. They can be adapted at the factory to the requirements of specific regulations with the necessary closing and opening delays.



**SUZLON**

**Operational safety even in extreme environmental conditions**

The reliability of the overall system, however, not only includes the failsafe performance of the system but also operational safety, i.e. protection of man and machine. Nowadays, safety has become very important in all areas, not only because of the sudden increase in insurance premiums.

Suzlon, the biggest wind mill manufacturer in Asia, with headquarters in Pune, India, installs Moeller's electrical switchgear in its turbines. Despite diverse weather conditions near the Indian Ocean or mountainous locations at altitudes of 1000 metres above sea level, the products run smoothly. The contactors and motor-protective circuit-breakers offer the reliability required – at any time or place.



**System solutions from a single source**

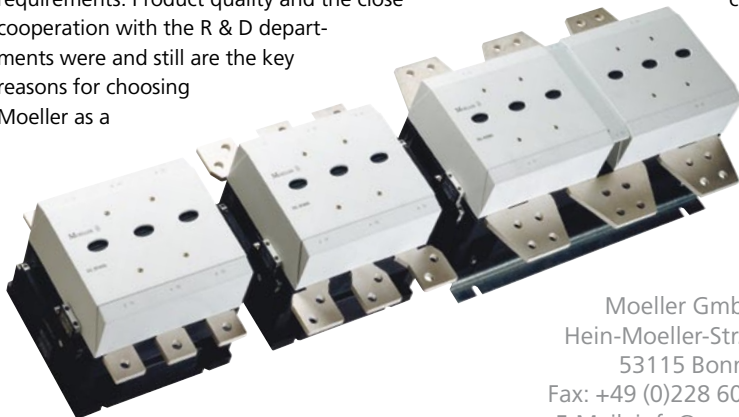
Wind turbines are not only available in the multi-megawatt class. Smaller generators are used in areas where network capacity is unsuitable for taking larger currents, or for the supply of isolated local networks. Windflow Technology,

the wind turbine manufacturer from Christchurch, New Zealand, has therefore set new standards for the wind energy market with its 500 kW turbine. Kenneth Swift, Managing Director at Bremca Industries and responsible for the electrical equipment of these units, explains: "Here in New Zealand, we have developed our own cost-effective wind turbine suitable for applications worldwide. This features a two-blade rotor, in conjunction with a new torque limiting gearbox system. This allows the use of a synchronous generator that inherently provides controllable reactive and active power generation. We use Moeller components for the entire electrical system because we know by experience that we can trust the reliability of these components." The central control of the turbine is implemented using an XC200 PLC with an Ethernet interface and integrated web visualization. Compact dimensions, an integrated fieldbus interface and user-friendly data acquisition by means of a standard multimedia card (MMC) are the outstanding features of this PLC system. Contactors and circuit-breakers ensure reliable power supply network connection, whilst the hydraulic pump motors in the nacelle and the pony motor for synchronous generator operation are protected by motor-protective circuit-breakers.

**WORLDWIDE**

All leading wind turbine manufacturers are engaged in intense competition in world markets. Access to markets is frequently made difficult on account of costly additional device approvals and national safety requirements. An international presence and local production are entry conditions for opening up thriving markets. For this Moeller offers a product range with extensive international approvals and standards that allow use in virtually every country in the world. Moeller supports wind turbine manufacturers in their access to new markets whilst the Moeller sales network, with 350 offices in over 80 countries, can ensure fast delivery and expert advisory support on site.

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