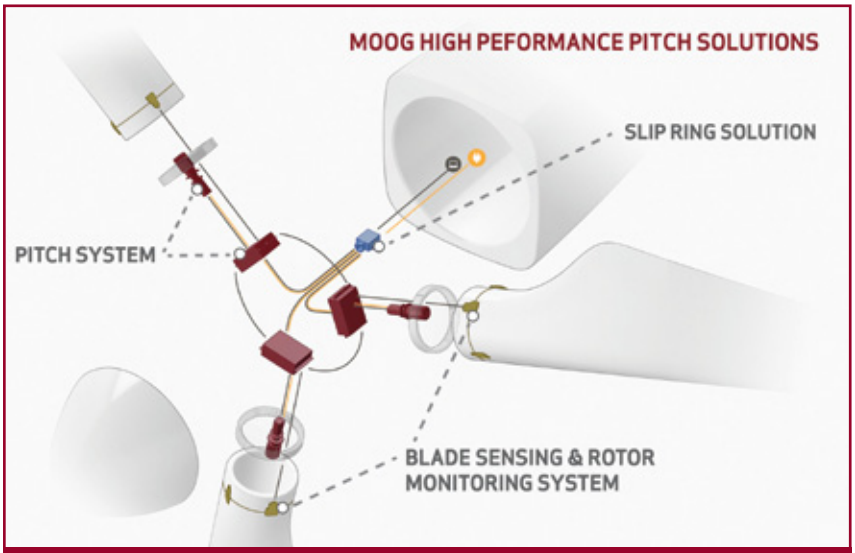
HIGH PERFORMANCE AND TOTAL PROTECTION FOR OFFSHORE WIND TURBINES

Moog's leading-edge pitch control technologies ensure reliability in the world's harshest offshore environments.

Around the world, leading OEMs and international energy providers depend on high performance Moog solutions to keep their offshore wind turbines operating safely and reliably. In fact, more than 25,000 Moog pitch systems and products, slip ring solutions, and blade sensing systems are in operation worldwide. And our trained technicians provide an unsurpassed level of expertise and support for customers everywhere.



PITCH SOLUTIONS: ENSURING HIGH PERFORMANCE IN HARSH ENVIRONMENTS

Accurately controlling the pitch of a wind turbine's blades is essential to the overall performance of the turbine. Particularly in offshore environments, each blade is subjected to instantaneously changing loads and forces.

Pitch Systems – Deliver the maximum efficiency and ensures greater productivity through less maintenance-related downtime. Moog's flexible pitch solutions enhance the energy efficiency of blades in onshore and offshore locations.

Rotor Monitoring Systems – Provide early detection of operational and maintenance issues.

Blade Sensing Systems – Supply accurate real-time information to the pitch system or main controller of the wind turbine.

Slip Ring Solutions – Ensure reliable data and power transmission in both electric and hydraulic systems.

A FOCUS ON OFFSHORE APPLICATIONS

For nearly 15 years, Moog has worked with global customers in the wind energy industry. Today, through technological innovation, a rapidly advancing research and development division, and expanded manufacturing capabilities, we remain committed to supporting multi-megawatt turbines in the offshore sector. This commitment has helped us become the leading supplier of pitch control products for 5 MW and larger offshore wind turbines.

As rotor size increases and the overall size and energy output of offshore wind turbines grows, Moog solutions continue to overcome the challenges posed by offshore applications including:

- 24/7 operation
- Environmental hazards
- Remote operations and diagnostics
- More efficient operation
- Extending operational life

COLLABORATION AND EXPERTISE

With proven expertise in both electric and hydraulic technologies and the vast global resources of a two-billion dollar corporation, Moog's collaborative approach to solving customer challenges makes us the ideal partner for pitch control solutions that help your offshore turbines operate safely, more efficiently and more reliably.

YOUR PARTNER IN PITCH CONTROL

MOOG

Why choose Moog pitch control for your offshore applications?

As a world leader in pitch control solutions, Moog offers key advantages to ensure offshore reliability and performance.

WORLD-CLASS PRODUCTS

Moog designs and manufactures a full array of products for offshore applications including:

- **Pitch Systems** that incorporate highly corrosive-resistant materials on the switch gear cabinets. Cabinets are tested in a climate chamber that simulates extreme conditions. The result is components that are highly reliable and provide high performance in harsh environments.
- **Pitch Motors** that are built to meet the requirements of corrosion class C5M (according to DIN 12944 Standards) and utilize wind-proof connector technology. Our Pitch Motor is suitable for hot climate versions (HCV) and cold climate versions (CCV) and is designed for reliable performance under demanding environmental conditions with high vibration, extreme temperatures and high humidity.
- **Pitch Servo Drives** developed for harsh conditions in the rotor hub and operation under internal switchgear cabinet temperatures from -30 to +70 °C (-22 to +158 °F). In addition, a flexible design provides selectable installation positions and is resistant to vibration, shock and permanent shock.

LARGE TURBINE EXPERIENCE

Since equipping the first 5 and 6 MW turbines, Moog has been a pioneer in supplying pitch control systems and products for the world's largest offshore wind turbines. Today, we're a leading supplier of electric pitch systems for onshore and offshore wind turbines.

PROVEN OFFSHORE EXPERTISE

Moog's collaborative expertise means we can tailor technology solutions to your unique turbine designs. And because we test our products in climate chambers and subject them to other environmental stress factors, you are assured of high performance in hostile offshore conditions.

TOTAL SUPPORT

Moog technical teams are positioned in more than 25 countries worldwide, so we speak your language and know the region. For service, training and parts, count on Moog Global Support™ to reduce cost of ownership, extend product and system life, and minimize your maintenance requirements.

MOOG GLOBAL SUPPORT™

Moog has offices around the world. For more information or the office nearest you, contact us online.

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This technical data is based on current available information and is subject to change at any time by Moog. Secifications for specific systems or applications may vary.

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