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Sensors & Instrumentation

Draw wire sensors
wireSENSOR

MICRO-EPSILON

Displacement measurement on wind turbine rotor testers

Accurate test methods are increasingly being relied on for the development of new geometrical shapes and production technologies for wind turbine rotors. Therefore, some test rigs have been developed for load tests on wind turbine rotor blades that simulate the real loads caused by high winds and storms. It is important during these tests that the expensive rotor is not destroyed. Conventional rotors are currently between 40m and 60m in length and are manufactured in a half shell sandwich design made from glass fibre reinforced plastic.

The Fraunhofer Institute IWES in Bremerhaven has developed a test rig that can be used to test rotor blades up to 70m in length. The tip of the rotor blade can be distorted by up to 10m due to mechanical loads. For this, the rotor blade is mounted horizontally in the test rig. Steel cables are routed to the rotor using guide pulleys and attached to the rotor blade at various positions either directly or via mechanical clamps.

Twelve draw-wire sensors are used on the test rig for measuring the distortion. Two sensors per traction point measure the deflection and torsion of the rotor blade. For this, the sensors are mounted on rails on the ground; the measuring wire is attached to pre-fabricated eyes on the terminals. The simple handling and the robust design of the sensors were ideal for this application. The draw-wire sensors operate with measuring ranges between 3m and 10m. The digital signal output is provided for further simulations.

Benefits for the customer:
- Robust aluminium housing
- Telescopic measuring method
- Simple mounting

Requirements for the measuring system:
- Robust design
- Up to 10m measuring range

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