



5 & 10mm Gaps Improve Wind Power Gearbox Testing

An S. Himmelstein and Company Bearingless Torque Sensor Application

To reduce pollution from fossil fuel powered electric generation and in response to Government mandates, the wind power industry has made substantial advances in turbine generators. Those advances include cost reduction, increased output power, improved efficiency and greater reliability. A wind power gearbox is a critical part of a wind turbine generator. It is used to increase and optimize the generator input speed and it directly affects the turbines reliability, efficiency and power output.



Wind farms are often located in mountains and offshore – areas with harsh environmental conditions. Should a gear box fail, the cost and time required to replace or service it is very high and is borne in full or in part by the maker. As a result every maker has extensive quality control procedures and each gear box undergoes comprehensive performance testing.



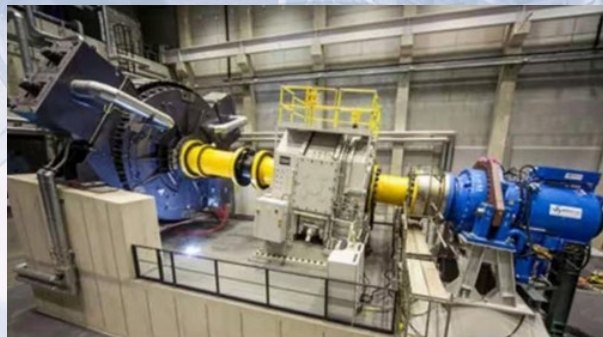


S. HIMMELSTEIN & COMPANY

The World's Best Torque Sensors Since 1960

Gear box performance measurements require dynamic torque sensors to determine their power and efficiency. Many makers have adopted traditional Bearingless Torque Sensors for this purpose. However, During the past decade it has become apparent that their small rotor-to-stator gaps and hoop antennae create problems during installation and de-bugging and excessive failures due to rotor-to-stator collisions.

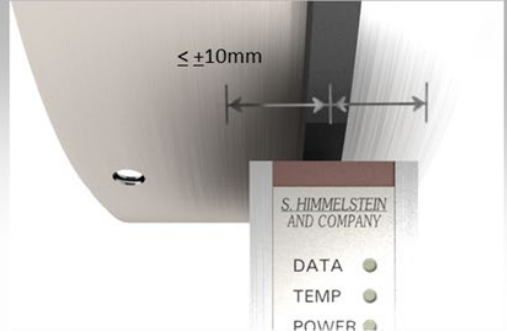
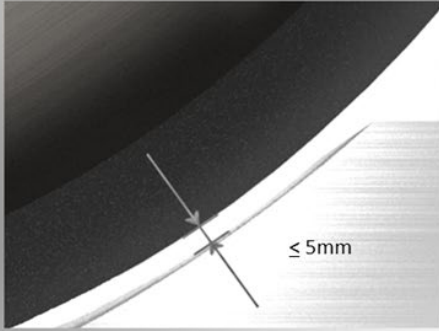
Presented with these concerns, the Himmelstein Company developed a more reliable solution. Himmelstein sensors use proprietary signal transmission technology. The stator antenna doesn't use a hoop or caliper structure. Instead it uses an open arc design (approximately 280 degrees, model dependent) which simplifies installation and removal. For high capacity units typical spacing is 10mm axial and up to 7 mm radial. S. Himmelstein and Company is one of the few sources worldwide for high and super high range Dynamic Bearingless Torque Sensors; standard designs include 1,000 kNm single and dual range sensors.





S. HIMMELSTEIN & COMPANY

The World's Best Torque Sensors Since 1960



Simple, Non-critical Installation

- First bolt the rotor to the system driveline
- Then slowly move the **powered** stator assembly, from any direction and angle, toward the rotor antenna until its LEDs show green
- Bolt the stator in place
- The sensor is then ready to measure driveline torque and speed (option)



S.HIMMELSTEIN & COMPANY

The World's Best Torque Sensors Since 1960

This procedure is stress free for installation technicians, requires no special tools and is simple to implement. With 5mm radial and 10 mm axial gaps, open antenna and visual confirmation it's much easier to achieve a good installation than with the competitive small spacing and hoop antenna. Moreover generous gaps provide increased reliability by vastly reducing rotor to stator collisions. The Himmelstein design also permits operation during thermal growth that occurs when the sensors are used for long term field studies. Finally Himmelstein torque sensors have guaranteed 150% Overage with Combined Errors $\leq 0.1\%$ of full scale in the Overage Region. That reduces errors when torques exceed the sensors capacity and greatly reduces errors due to clipped torque peaks.



S.HIMMELSTEIN & COMPANY

2490 Pembroke Avenue
Hoffman Estates, IL 60169
www.himmelstein.com
847-843-3300