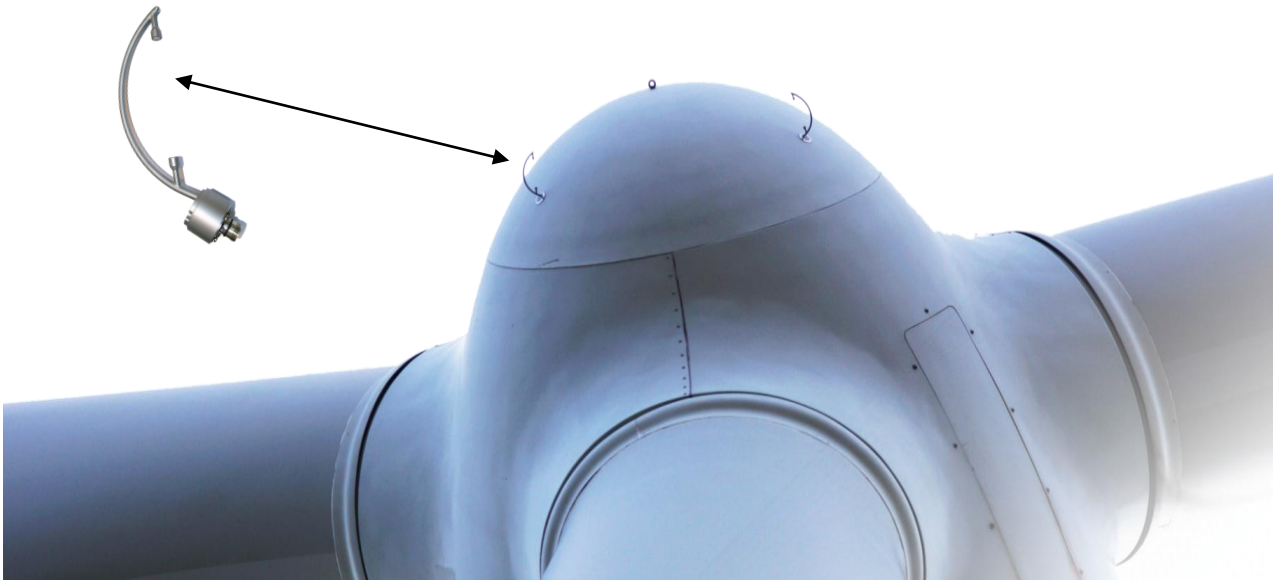
uSonic-1 Spinner

- previously Spinner Sonic

- **Innovative spinner mounted wind sensing technique using ultra sonic anemometry**
- **Precise wind measurements in front of the rotor**
- **Avoidance of flow distortion as known for nacelle installations**
- **Optimization of yaw control**
- **Expected increase of wind turbine performance by 1 - 5 %**
- **No moving parts, easy maintenance from inside of the turbine**
- **Ice protection by efficient sensor heating**
- **Worldwide sales by patent holder ROMO WIND AG, Switzerland (EP 1733241)**



METEK GmbH, Fritz-Strassmann-Str. 4, 25337 Elmshorn, Germany
Phone: +49 4121 43590, Fax: +49 4121 4359 20
E-mail: info@metek.de, Internet: http://www.metek.de

uSonic-1 Spinner

- previously Spinner Sonic

An innovative technique for precise wind measurements on a wind turbine has been developed and implemented successfully in various test sites. The new concept allows an improved monitoring of the yaw angle and optimizes the efficiency of wind turbines. It uses the spinner as a mounting structure for aligned sonic sensor paths and avoids flow distortion effects observed at nacelle installations. CFD modeling yields the optimum position for each spinner type minimizing calibration efforts.

The technique has been invented at Risoe/DTU and was set up in various prototypes by modifying Metek's uSonic-3 Scientific system which has proven its reliability and robustness in harsh environments and adverse climate regions.

For worldwide sales, please contact the patent holder (EP 1733241) ROMO WIND AG, Zug, Switzerland (www.romowind.com).

Close-up of uSonic-1 Spinner

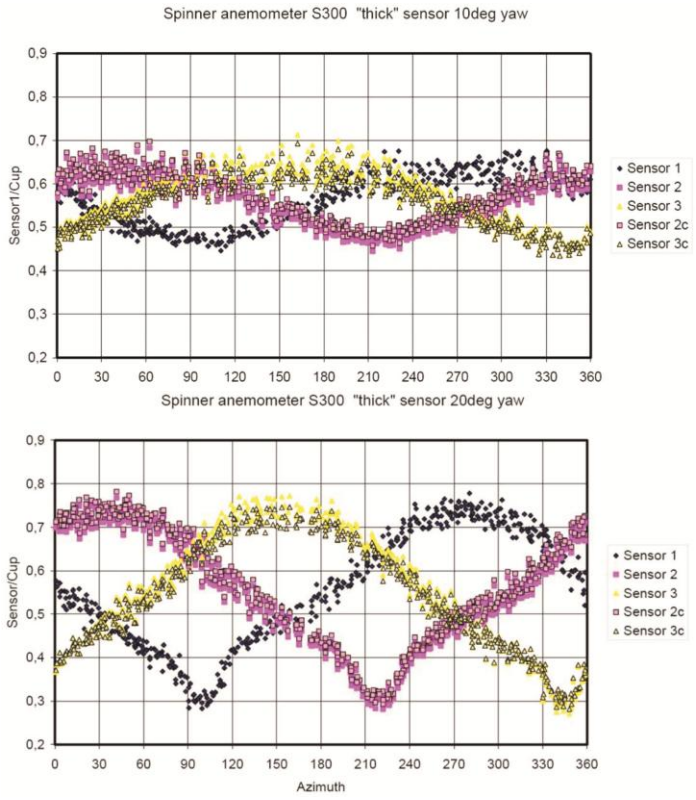
METEK GmbH, Fritz-Strassmann-Str. 4, 25337 Elmshorn, Germany
Phone: +49 4121 43590, Fax: +49 4121 4359 20
E-mail: info@metek.de, Internet: http://www.metek.de

uSonic-1 Spinner

- previously Spinner Sonic

Typical performance characteristics of the spinner anemometry by uSonic-1 Spinner can be seen from the table below:

	Range	Resolution
Wind speed measurement	0 – 40 m/s	0.025 m/s
Yaw error measurement		1°
Inflow inclination angle measurement		1°
Air temperature measurement		1 K
Measurement duration (complete measurement cycle)		0.010 s
Sampling frequency (serial line output)		0.10 Hz – 10 Hz
Internal sample rate F	10 – 20 Hz 10 Hz default	
No of samples for averaging Nave	1000 – 3000	
Averaging time T = Nave / F	1 s – 150 s	



Wind speeds measured by Spinner SONIC (sensor 1, 2, 3) during consecutive rotations of the spinner at a yaw angle of 10° (upper) and 20° (lower) relative to non-rotating reference measurement (sensor 2c, 3c).

The non-optimum positioning of the rotor is shown by the amplitudes of the three time series. The high reproducibility of the series proves both, accuracy and precision of this new technique for wind sensing at wind turbines.

METEK GmbH, Fritz-Strassmann-Str. 4, 25337 Elmshorn, Germany
Phone: +49 4121 43590, Fax: +49 4121 4359 20
E-mail: info@metek.de, Internet: http://www.metek.de