MORE RELIABLE MORE ACCURATE ALTERNATIVE TO ULTRASONIC WIND SENSORS

MeteoWind® Compact
Simply reliable

ANALOG output	2 pulses/rev & 0-2.5V
Wind speed accuracy	< 1 % or ± 0.2 m/s FS + MEASNET
Wind drection accuracy	± 2° (no dead-spot)
Measurement range	0-80 m/s

MeteoWind® 2
All-weather precision

Resolution (**MODBUS**)	0.01 m/s @ 10 Hz
Wind speed accuracy	<1 % or ±0.2 m/s FS + MEASNET
Wind direction accuracy	± 2° (no dead-spot)
Measurement range	0-90 m/s

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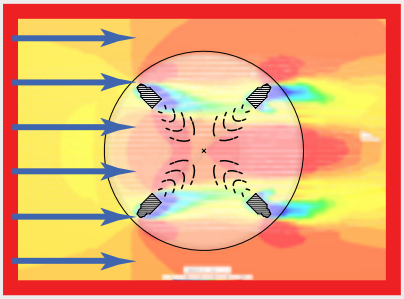
meteo innovations

PREDICTING SUCCESS BASED ON WEATHER

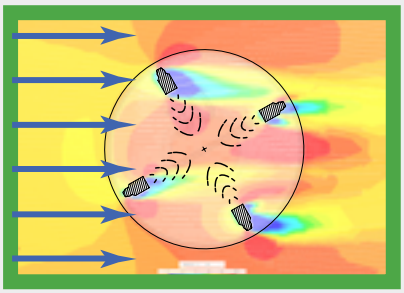
BEYOND THE DATASHEET

UNDERSTANDING ACCURACY OF ULTRASONIC WIND SENSORS

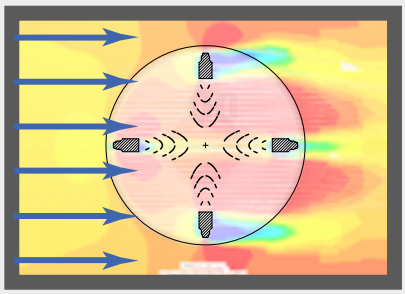
45° orientation



30° orientation



0° orientation



A **top-down view** of 10 m/s wind (yellow) from the left shows the large wind speed variations from -2.5 m/s (blue) to 13 m/s (red) within an ultrasonic anemometer's measurement chamber. Additional reading: Wind Tunnel Tests of Some Low-Cost Sonic Anemometers, Michael C. Sturgeon, NOAA

The truth about ultrasonic anemometer accuracy

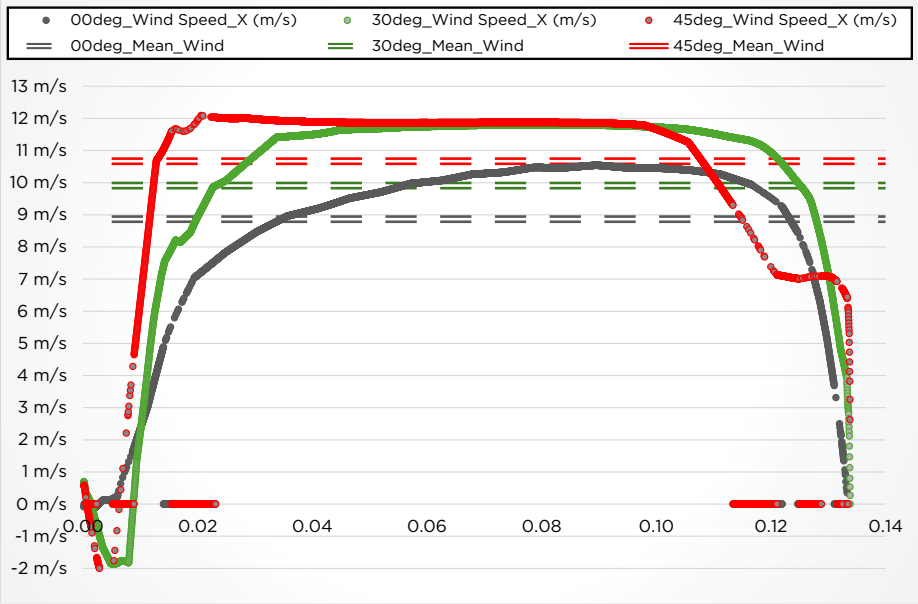
Ultrasonic anemometers exhibit wind direction-dependent accuracy due to turbulence behind their ultrasonic sensors. Wind directions deviating from the calibrated direction can introduce up to **7% additional error**, beyond the datasheet specifications.

Wind direction bias: A closer look

These 10 m/s wind simulations using CFD reveal significant wind speed variations from -2.5 up to 13 m/s within the measurement chamber highlighting the impact of wind direction on sensor accuracy. The plot below shows these speed variations in detail on straight lines between the ultrasonic transducers. Impact of wind direction on average wind speed is large and cannot be fully compensated.

All-weather performance and reliability

Multiple case studies have been performed proving that the patented MeteoWind elliptical cup anemometers offer better all weather performance even without heating, than most ultrasonic anemometers. Maintenance-free periods range from 5 to 10 years without problems from bird damage.



The solid lines illustrate how wind speed varies (from -2.5 to 13 m/s) within the anemometer's measurement chamber, specifically between pairs of ultrasonic sensors. The color of each curve matches the corresponding frame color in the CFD simulation results shown above. Dashed lines represent the average wind speed measured by each sensor pair for each anemometer orientation. These average values require further correction to account for factors like wind direction, turbulence generated by the ultrasonic transducers themselves, and flow deformation caused by the anemometer's structure.

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check out our website
baranidesign.com