Ultrasonic Wind Sensor

uSonic-3 Cage *MP*

- New approach in 3D wind and turbulence sensing
- Unique "Multi-Path" measuring technique
- 3 x 3D sonic arrays in one sensor head
- 3 x 3 = 9 Radial wind components
- 3 x Directly sensed vertical wind component
- 3 x 3 Acoustic temperatures
- Minimum flow distortion by optimized design of sensor head and sonic transducers
- Optimized omni-directional sonic probe for mast top
- Online control and dynamic adjustment of signal gain
- Efficient sensor head heating (option)
- Internal mass storage on SD card (option)
- Convenient communication and data output by RS422 and Ethernet ports
- Remote control of system performance
- Ideal instrument for accurate routine operation and scientific applications (eddy covariance sites)

METEK Meteorologische Messtechnik GmbH

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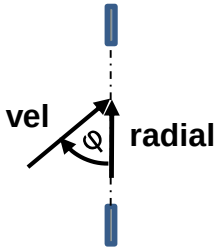
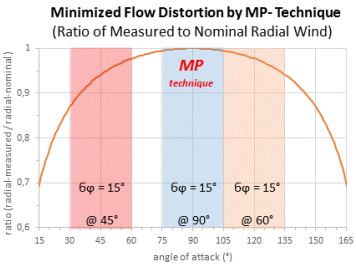
Typical instrumental applications

- Operational measurements of turbulence parameters
- Research in atmospheric turbulence
- Eddy covariance sites
- Climatological studies
- Observation of low turbulence (e.g. arctic/antarctic areas)
- Remote research stations
- Compact mobile set-ups



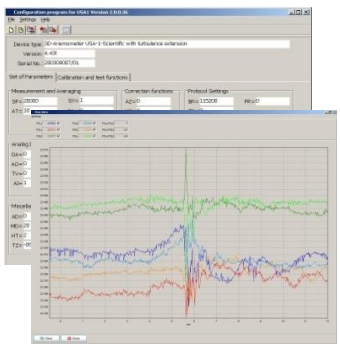
The ultrasonic anemometer **uSonic-3 Cage *MP*** represents an innovative step forward to highest performance in atmospheric turbulence sounding. Based on the well proven METEK ultrasonic sensor family uSonic-3 the sensor head enables the user to perform three independent measurements of the air flow quasi-simultaneously by arranging one sonic transmitter to three opposite sonic receivers. This provides redundancy in horizontal wind components measurements and allows a selection of the most advantageously positioned transmitter-receiver couples. Furthermore, the sensor delivers three directly measured vertical wind components.
An embedded 2-axis inclination sensor (option) provides tilt angles of the sensor head thus allowing remote control of correct instrumental set-up.
The sensor outputs 9 radial components, 9 temperature measures and 3 Cartesian wind components (x, y, z) as raw data or as averaged data with adjustable interval lengths.

Due to its compact design the **uSonic-3 Cage *MP*** fits perfectly to top mast installations.



Ambient conditions	- 40 … + 60 °C, 5 … 100 % rH
Average time / number	1 … 3600 s / 1 ... 65365 samples
Sampling rate	max. 30 Hz (→ max. 3 x 30 = 90 Hz conventional sampling)
Measuring ranges	max. 40 m/s, - 40 … + 60 °C
Accuracy wind component - max. dev. - rms - resolution	Acceptance angles ± 180 ° (omni-directional) ± 1 % @ 5 m/s, 0 ° ... 10 ° of horizontal ± 2 % @ 5 m/s, 10 ° … 20 ° of horizontal 0.5 % @ 5 m/s, 0 ° ... 10 ° of horizontal 1 % @ 5 m/s, 10 ° … 20 ° of horizontal 0.006 m/s (vertical), 0.01 (horizontal)
Accuracy wind direction - max. dev. - rms	Acceptance angles ± 180 ° (omni-directional) ± 1 ° @ 5 m/s, 0 ° ... 20 ° of horizontal 0.5 ° @ 5 m/s, 0 ° … 20 ° of horizontal
Accuracy temperature - resolution	 0.01 K
Output data set	9 radial components (incl. 3 x vertical), 9 temperatures, x, y, z, T, vel, dir
Output protocols	standard, checksum, NMEA
Synchronisation	1 x digital in, 1 x digital out
Turbulence module (upgrade option)	online calculation of means, variances, covariances, heat flux, momentum flux, Monin-Obukhov length, etc.
Internal memory (upgrade option)	SD card
Power supply	10 ... 36 VDC / 2.5 W (without options)
Sensor head heating (option)	10 ... 24 VDC / max. 100 W
Communication	RS422, RS485 (300 ... 115200), Ethernet, all ASCII
Analog output (upgrade option)	4 x 12 bit, 0 … 10 VDC or 0/4 … 20 mA (max. load 250 Ω), adjustable ranges (x, y, z, T)
Measuring paths	6 x 53.2 ° / 90 °, L = 165 / 135 mm
Inclinometer (upgrade option)	2 axis, resolution 0.1 °, response time 0.5 Hz

Graphic User Interface



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