



Lufft Ventus: Ultrasonic Wind Sensor
For measuring the wind speed, wind direction,
barometric pressure, and virtual temperature

Lufft Ventus

Ultrasonic Wind Sensor

Wind is measured by means of four ultrasonic sensors using run-time differential calculation for determining the resulting wind speed and wind direction. Wind is internally measured using 10 Hz rate and complies with the requirements of the WMO guideline providing output of vector and scalar means, maximum gust, and corresponding wind direction as well as extreme values.

Built-in data pre-processing and output through the SDI-12 (factory setting) or RS-485 serial interfaces using selectable output protocols provide interface compatibility of the unit for all OTT dataloggers, ADCON RTUs as well as for commercially available HydroMet dataloggers and PLC systems.

The sensor is designed to be used for extreme applications in all climate zones and has a heater which keeps the unit free of ice even in the lowest temperature. The heater may be switched off making the unit suitable to be used for solar-powered automatic meteorological stations.

The sensor is suited to be used for all professional meteorological applications that require high reliability, robustness, no maintenance without the need to be re-calibrated, or ice-free operation. The sensor has successfully been tested and certified according to international standard, in extreme ambient conditions with regard to temperature, air humidity, electromagnetic compatibility, vibration, salt spray, and icing.

Meteorology

Wind speed, wind direction, barometric pressure, and virtual temperature – Lufft Ventus

Features

Multi-format data output via SDI-12 (factory setting) or RS-485, or analog output, may be selected through PC Lufft-Config tool software for Windows operating system using RS-485 PC interface converter:

- SDI-12
- RS-485
- 4-20mA/2-10VDC analog output

The following features may be set using the Lufft-Config tool or SDI-12 commands

- Metric or imperial unit output
- Heating mode
- Elevation of the location for relative barometric pressure

Applications

- Synoptic automatic weather station for meteorological services
- Marinas and heliports
- Weather stations onboard ships
- Wind turbine control
- Airport and air traffic control
- Weather observation for road and traffic control systems
- Hydrological station for dykes and river areas
- Mountain weather station for flood and avalanche warning
- Urban or industrial weather station for sewage-treatment plants and sluices

Calculated Wind Data

- Instantaneous values in intervals from 1 to 10 seconds
- Vector and scalar means in intervals from 1 to 10 minutes
- Maximum/minimum values of the wind direction sectors
- Maximum gust of wind and wind direction
- Virtual temperature

Accessories

- 15m long cable with mating connector and bare-wire ends
- 50m long cable with mating connector and bare-wire ends
- 24VDC/240 W for heater, IP20 for housing installation



Technical data

Wind speed

- Measuring method: 4x 10Hz ultrasonic sensors
- Measuring range: 0 ... 75 m/s
- Resolution: 0.1 m/s
- Accuracy: ± 0.2 m/s or $\pm 2\%$ RMS
- Threshold: 0.1 m/s

Wind direction

- Measuring method: 4x 10Hz ultrasonic sensors
- Measuring range: 0 ... 359.9°
- Resolution: 0.1°
- Accuracy: $< 2^\circ$ (> 1 m/s) RMSE
- Threshold: 0.1 m/s

Virtual air temperature

- Measuring method: Ultrasonic technology
- Measuring range: -50 ... +70 °C
- Resolution: 0.1 °C
- Accuracy: ± 2 K (no heating, no solar irradiation, or wind speed above 4m/s)

Barometric pressure

- Measuring method: MEMS sensor, capacitive
- Measuring range: 300 ... 1200 hPa
- Resolution: 0.1 hPa
- Accuracy: ± 1.5 hPa

Electrical data

The following interfaces may be selected using the Lufft-Config tool (PC software for Windows OS):

- SDI-12, release 1.3 (factory setting)
- RS-485, galvanically isolated, half-duplex, baud rates 1200 ... 19200
- RS-485 protocols: Binary, ASCII, TLS2002FG3, MODBUS, NMEA-WIMWV
- Analog output: 4 ... 20 mA or 2 ... 10 VDC, 16 bits

Power supply

- Input voltage: 10.5 ... 28 VDC
- Power consumption (sensor): 50 mA @ 12 VDC
- Heater: 24 VDC/240 W

Ambient

- Operating temperature range**
- 40 °C ... +60 °C (with heater)
- 20 °C ... +60 °C (without heater)

Storage temperature

- 55 °C ... +80 °C

Relative humidity

- 0 ... 100 % R.H.

General data

Dimensions (H x Ø)

- 170 mm x 150 mm

Weight

- 1.7 kg

Fastener

- Ø 50 mm

Material

- Seawater resistant AlMg3Si aluminum alloy

Color

- Gray

Type of protection

- IP66

Standards

- EMC directive: 2004/108/EC
- Emitted interference: EN 55011:2009, EN 61000-6-3
- Immunity: EN 61000-6-6 and EN 61000-4-2/3/4/5/6/8
- Vibration: IEC 60068-2-6/IEC 60945
- Salt spray: MIL-STD 810, 509.3
- Ice: MIL-STD 810F, 521.2