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Ultrasonic Wind Sensor WM80

Vaisala Ultrasonic Wind Sensor WM80 offers unparalleled wind speed and wind direction measurement performance with the Vaisala WINDCAP® ultrasonic technology combined with an innovative, robust, and compact form factor. WM80 is designed for operations where uninterrupted wind data is crucial, such as wind turbine control, ship navigation, and dynamic positioning.

Features

- Anodized aluminum structure
- Automatically controlled heating
- Measurement range up to 90 m/s (220 mph)
- Measurement performance characterized at accredited wind tunnel
- Novel reflector design (patent pending)
- Fully compensates effects of temperature, humidity, and pressure
- Push-pull cable connector
- No need to calibrate during device lifetime
- Optional alignment tool
- Designed and manufactured in Finland

Ruggedness and reliability in harshest conditions

WM80 is designed and heavily tested to operate reliably in extreme conditions - whether tropical or freezing - measuring accurately in heavy precipitation and extreme temperatures. In icy conditions, the 11 automatically controlled heating elements keep the device operational, providing excellent heat distribution in the aluminum structure. For non-icing environments, a device model with heated transducers is available. The highly accelerated life test (HALT) methodology was used during product development to enhance product reliability.

Innovative technology

WM80 uses a novel reflector design that focuses the ultrasonic signal to the transducers providing 10 times stronger signal and exceptionally reliable wind measurements throughout the entire range of 0–90 m/s (0–200 mph). The patent-pending design makes it possible for the signal beam to maintain its position in changing wind conditions.

The measurement reliability and accuracy is further improved by the sensor's ability to withstand rain and condensation. In addition to heating and the tilted design of the transducers, intelligent signal control - combined with the strong signal level - eliminates the need for hydrophobic coating that wears off over time.

Accuracy and data availability

Vaisala has over 50 years of experience in high-quality wind measurements. The WINDCAP® technology uses 6 measurement paths instead of the conventionally used 4 measurement paths, providing better measurement accuracy and data availability. The measurement accuracy of the renowned WINDCAP® technology in WM80 has been coupled with a closed form factor for this next generation device.

The closed design protects the measurement volume from external disturbances, such as birds and falling ice, and enables the use of reflectors, while still providing enough room for the signal to travel inside the measurement volume. Even when the wind reaches the sensor at an angle, it can be captured and measured.

Tools for successful setup

Installation and alignment with ready-made Vaisala accessories is easy regardless of whether your installation site is high above the ground or constricted in space. The simple and sturdy cable with a push-pull connector at the device end is fast to use. WM80 does not need to be calibrated during its lifetime.

Technical data

Wind measurement performance

Measurement rate	10 Hz
Averaging	Up to 3600 s
Wind speed	
Measurement range	0–90 m/s (0–200 mph)
Accuracy	0.1 m/s or 2 % at 0–50 m/s (0–112 mph) 5 % at > 50–90 m/s (112–200 mph)
Resolution	0.01 m/s (0.0223 mph)
Wind direction	
Measurement range	0–360°
Accuracy	4° at 1–5 m/s (2–11 mph) 2° at 5–50 m/s (11–112 mph) 5° at > 50 m/s (112 mph)
Resolution	0.01°, 0.1°, or 1° (depending on the protocol)

Mechanical specifications

Weight, sensor	650 g (22.9 oz)
Connector	10-pin push-pull connector
Materials	Anodized aluminum (6026LF marine and offshore grade)
Installation	With mounting adapter to hollow pole

Compliance

EU directives and regulations	EMC, RoHS
Electromagnetic compatibility (EMC)	IEC/EN 61326-1, industrial environment IEC/EN 61000-6-2 IEC/EN 61000-6-4
Electrical safety	IEC/EN/AS/UL/CSA-C22.2 61010-1
Type approvals	DNV GL certificate no. TAA00003KF
Compliance marks	CE, China RoHS, FCC, ICES, KC, RCM

Data communication

Data communication interface	RS-485
Communication protocols	NMEA 0183 ASCII Modbus RTU
Measurement unit, wind speed	m/s (NMEA, ASCII, Modbus) knots (NMEA, ASCII)
Configuration interface	Modbus RTU Vaisala Insight PC software
Output update interval	0.1–600 s, configurable

Analog outputs

Wind speed and wind direction	2 × 4–20 mA
Output type	Sourcing
Maximum load resistance	300 Ω
Update interval	0.1 s

Powering

Operating voltage	24 V DC, +30 / −25 %
Overvoltage category	CAT I
Operating current [1]	
Heated transducers, device top, and device body	Max. 11 A
Heated transducers	Max. 2 A

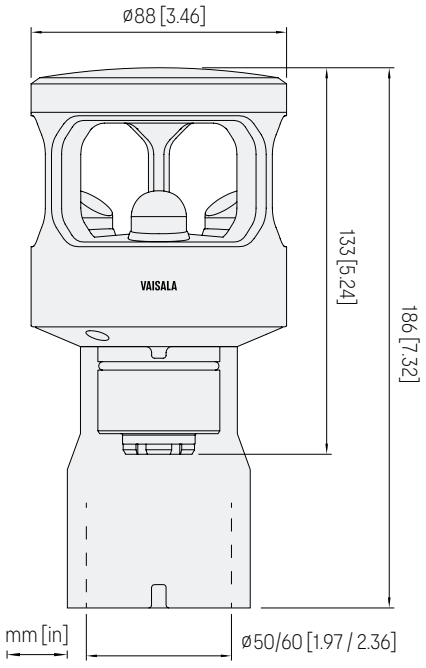
1) The operating current of WM80 depends on the ambient conditions.

Operating environment

Operating environment	Outdoor use
Use in wet location	Yes
Operating temperature	−40 … +60 °C (−40 … +140 °F)
Solar radiation	1120 W/m^2 at +60 °C (+140 °F)
Operating humidity	0–100 %RH, condensing
Survival wind speed	100 m/s (224 mph)
Maximum operating altitude	4000 m (approx. 13 100 ft)
Pollution degree	4
IP rating	IP66 and IP67
UL 50E/NEMA rating	Type 4
Storage temperature	−40 … +85 °C (−40 … +185 °F)
Storage humidity	0–100 %RH, non-condensing
Heater control	Automatic

Options

Heating	• Heated transducers, device top, and device body • Heated transducers
Mounting adapter	• 50-mm mounting adapter, standard • 50-mm mounting adapter, isolated • 60-mm mounting adapter, standard
Cable	• Cable 2 m • Cable 11 m • Cable 19 m



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