# Weather Transmitter WXT530 Series

## Features

- Right parameter combination
- Easy to use and integrate
- Weather parameter hub
- Analog sensors can be added
- Compact, lightweight
- Low power consumption
- mA output suitable for industrial applications
- Cost-effective
- DNV GL Type Examination

Vaisala Weather Transmitter WXT530 is a unique series of sensors with parameter combinations that allow you to choose what is right for your application. WXT530 is a flexible, integrated building block for weather applications. WXT530 series improves your grip on weather.

## Flexibility

WXT530 is a series of weather instruments that provides 6 of the most important weather parameters: air pressure, temperature, humidity, rainfall, wind speed and direction through various combinations. You can select the transmitter with the needed parameter(s) into your weather application, with a large variety of digital communication modes and wide range of voltages. A heated option is available. Low power consumption enables solar panel applications. WXT530 Series focuses on maintenance-free operations in a cost-effective manner.

## Integration

The series offers analog input options for additional third-party analog sensors. With the help of the built-in analog-to-digital converters, you can turn WXT530 into a small, cost-effective weather parameter hub.

Additional parameters include solar radiation and external temperature sensor. Further, the analog mA output for wind speed and wind direction enables a wide variety of industrial applications. WXT530 exceeds IEC60945 maritime standard.

## Solid performance

WXT530 Series has a unique Vaisala solid-state sensor technology. To measure wind, Vaisala WINDCAP® ultrasonic wind sensors are applied to determine horizontal wind speed and direction. Barometric pressure, temperature, and humidity measurements are combined in the PTU module. The PTU module is easy to change without any contact with the sensors. The precipitation measurement is based on the unique acoustic Vaisala RAINCAP® Sensor without flooding, clogging, wetting, and evaporation losses.

| Option | Rain | Wind | PTU 1) |
|---|---|---|---|
| WXT531 | ✔ | | |
| WXT532 | | ✔ | |
| WXT533 | ✔ | ✔ | |
| WXT534 | | | ✔ |
| WXT535 | ✔ | | ✔ |
| WXT536 | ✔ | ✔ | ✔ |

1) *PTU is a compact changeable module. Vaisala recommends changing it every 2 years.*

DNV GL TYPE EXAMINATION CERTIFICATE No. TAA00000VF

# Technical data

## Barometric pressure measurement performance

| | |
|---|---|
| Observation range | 500 ... 1100 hPa |
| Accuracy (for sensor element) at 600 ... 1100 hPa | ±0.5 hPa at 0 ... +30 °C (+32 ... +86 °F)<br>±1 hPa at −52 ... +60 °C (−60 ... +140 °F) |
| Output resolution | 0.1 hPa / 10 Pa / 0.001 bar / 0.1 mmHg / 0.01 inHg |

## Air temperature measurement performance

| | |
|---|---|
| Observation range | −52 ... +60 °C (−60 ... +140 °F) |
| Accuracy (for sensor element) at +20 °C (+68 °F) | ±0.3 °C (±0.54 °F) |
| Output resolution | 0.1 °C (0.1 °F) |

## Relative humidity measurement performance

| | |
|---|---|
| Observation range | 0 ... 100 %RH |
| Accuracy (for sensor element) | ±3 %RH at 0 ... 90 %RH<br>±5 %RH at 90 ... 100 %RH |
| Output resolution | 0.1 %RH |

## Wind measurement performance

| | |
|---|---|
| **Wind speed** | |
| Observation range | 0 ... 60 m/s (134 mph) |
| Reporting range | 0 ... 75 m/s (168 mph) |
| Response time | 0.25 s |
| Available variables | Average, maximum, and minimum |
| Accuracy | ±3 % at 10 m/s (22 mph) |
| Output resolution | 0.1 m/s (km/h, mph, knots) |
| **Wind direction** | |
| Azimuth | 0 ... 360° |
| Response time | 0.25 s |
| Available variables | Average, maximum, and minimum |
| Accuracy | ±3.0° at 10 m/s (22 mph) |
| Output resolution | 1° |
| Averaging time | 1 ... 3600 s, sample rate 1, 2, or 4 Hz (configurable) |

## Mechanical specifications

| | |
|---|---|
| **Weight** | |
| WXT534, WXT535, WXT536 | 0.7 kg (1.54 lb) |
| WXT531, WXT532, WXT533 | 0.5 kg (1.1 lb) |

## Operating environment

| | |
|---|---|
| Operating environment | Outdoor use |
| Operating temperature | −52 ... +60 °C (−60 ... +140 °F) |
| Storage temperature | −60 ... +70 °C (−76 ... +158 °F) |
| Operating humidity | 0 ... 100 %RH |
| Operating pressure | 500 ... 1100 hPa |
| Wind [1] | 0 ... 60 m/s (0 ... 134 mph) |
| IP rating | Without mounting kit: IP65<br>With mounting kit: IP66 |

1) *Due to the measurement frequency used in the sonic transducers, RF interference in the 200 ... 400 kHz range can disturb wind measurement.*

## Precipitation measurement performance

| | |
|---|---|
| Collecting area | 60 $cm^2$ (9.3 $in^2$) |
| **Rainfall** [1] | |
| Output resolution | 0.01 mm (0.001 in) |
| Field accuracy for daily accumulation | Better than 5 %, weather-dependent |
| Duration | Counting each 10-second increment whenever droplet detected |
| Duration output resolution | 10 s |
| Intensity | Running 1-minute average, 10 s steps |
| Intensity observation range | 0 ... 200 mm/h (0 ... 7.87 in/h) (broader with reduced accuracy) |
| Intensity output resolution | 0.1 mm/h (0.01 in/h) |
| **Hail** [2] | |
| Output resolution | 0.1 hits/$cm^2$ (1 hits/$in^2$), 1 hit |
| Intensity output resolution | 0.1 hits/$cm^2$h (1 hits/$in^2$h), 1 hit/h |

1) *Cumulative accumulation after the latest automatic or manual reset.*
2) *Cumulative number of hits against collecting surface.*

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 6 ... 24 V DC (−10 ... +30 %) |
| Average power consumption | Minimum: 0.1 mA at 12 V DC (SDI-12 standby)<br>Typical: 3.5 mA at 12 V DC (typical measuring intervals)<br>Maximum: 15 mA at 6 V DC (constant measurement of all parameters) |
| Heating voltage | DC, AC, or full-wave rectified AC<br>12 ... 24 V DC (−10 ... +30 %)<br>12 ... 17 V $AC_{rms}$ (−10 ... +30 %) |
| Typical heating current | 12 V DC: 800 mA, 24 V DC: 400 mA |
| Digital outputs | SDI-12, RS-232, RS-485, RS-422 |
| Communication protocols | SDI-12 v1.3, Modbus RTU,<br>ASCII automatic and polled,<br>NMEA 0183 v3.0 with query option |

## WXT536 analog input options

| | |
|---|---|
| Solar radiation | 0 ... 25 mV |
| Voltage input | 0 ... 2.5 V , 0 ... 5 V, 0 ... 10 V |
| Tipping bucket rain gauge | 0 ... 100 Hz |
| Temperature (Pt1000) | 800 ... 1330 Ω |

## WXT532 analog mA output options

When the analog output option is applied, digital communication is not available.

| | |
|---|---|
| Wind speed | 0 ... 20 mA or 4 ... 20 mA |
| Wind direction | 0 ... 20 mA or 4 ... 20 mA |

## Compliance

| | |
|---|---|
| EU directives and regulations | EMC, RoHS |
| EMC compatibility | EN 61326-1, industrial environment<br>CISPR 32 / EN 55032, Class B |
| Environmental | IEC 60068-2-1, 2, 6, 14, 30, 31, 78<br>IEC 60529, VDA 621-415 |
| Maritime | IEC 60945 (Exposed)<br>DNV GL Type Examination Certificate No. TAA00000VF |
| Compliance marks | CE, RCM, RoHS, China RoHS, UKCA |

VAISALA

www.vaisala.com

Published by Vaisala | B211500EN-K © Vaisala Oyj 2022

# WINDCAP® Ultrasonic Wind Sensor WXT532


**Features**

- Triangular design ensures excellent data availability
- Maintenance-free with no moving parts
- Optional heating available
- Compact, durable, and robust
- Low power consumption
- IP66 housing with mounting kit
- mA output suitable for industrial applications
- Cost-effective
- Optional accredited wind calibration (MEASNET) available

Vaisala WINDCAP® Ultrasonic Wind Sensor WXT532 is designed for demanding applications where stable and inexpensive wind measurements are required.

## Proven Vaisala performance

WXT532 incorporates decades of Vaisala experience in wind measurement using ultrasound to determine horizontal wind speed and direction. With no moving parts, the sensor has high sensitivity as the measurement time constant and starting threshold are virtually zero. This makes it superior to conventional mechanical wind sensors.

WXT532 is designed to operate without periodic field calibration and maintenance.

## Applications

WXT532 is ideal for use in marine applications as the housing with the mounting kit is water resistant. The sensor is also suitable for environmental monitoring, for example, for measuring wind speed and direction in automatic weather stations.

## Easy to install

WXT532 is delivered fully assembled and configured from the factory. With Vaisala configuration software tool you can change the settings, such as averaging times, output mode, update intervals, measured variables, and message contents.

The sensor can be mounted either on top of a pole mast or on a cross arm. When using the optional mounting kit, the north alignment needs to be performed only once.

## Heating

The optional heating available in WXT532 assists measurements in freezing or snowy weather conditions and in humid environments.

Since the heating circuit is independent of the operation power, separate power supplies can be used. Heating is switched on automatically at low temperatures, well before the freezing point.

## Low power consumption

WXT532 has very low power consumption: in idle mode the device typically consumes about 2 ... 3 mW.

TYPE APPROVED PRODUCT
DNV·GL
DNVGL.COM/AF

DNV GL TYPE EXAMINATION CERTIFICATE No. TAA00000VF

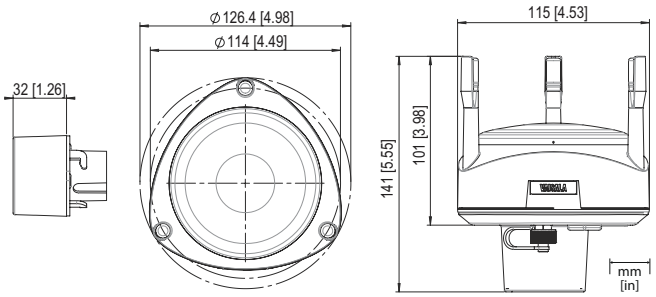
# Technical data

## Wind measurement performance

| | |
|---|---|
| **Wind speed** | |
| Observation range | 0 ... 60 m/s (134 mph) |
| Reporting range | 0 ... 75 m/s (168 mph) |
| Response time | 0.25 s |
| Available variables | Average, maximum, and minimum |
| Accuracy | ±3 % at 10 m/s (22 mph) |
| Output resolution | 0.1 m/s (km/h, mph, knots) |
| **Wind direction** | |
| Azimuth | 0 ... 360° |
| Response time | 0.25 s |
| Available variables | Average, maximum, and minimum |
| Accuracy | ±3.0° at 10 m/s (22 mph) |
| Output resolution | 1° |
| **Wind measurement frame** | |
| Averaging time | 1 ... 3600 s, sample rate 1, 2, or 4 Hz (configurable) |
| Update interval | 1 ... 3600 s (= 60 min), at 1 s steps |

## Inputs and outputs

| | |
|---|---|
| Operating voltage | 6 ... 24 V DC (−10 ... +30 %) |
| Average power consumption | Minimum: 0.1 mA at 12 V DC (SDI-12 standby)<br>Typical: 3.5 mA at 12 V DC (typical measuring intervals)<br>Maximum: 15 mA at 6 V DC (constant measurement of all parameters) |
| Heating voltage | DC, AC, or full-wave rectified AC<br>12 ... 24 V DC (−10 ... +30 %)<br>12 ... 17 V $AC_{rms}$ (−10 ... +30 %) |
| Typical heating current | 12 V DC: 800 mA, 24 V DC: 400 mA |
| Digital outputs | SDI-12, RS-232, RS-485, RS-422 |
| Communication protocols | SDI-12 v1.3, Modbus RTU,<br>ASCII automatic and polled,<br>NMEA 0183 v3.0 with query option |




## WXT532 analog mA output options

When the analog output option is applied, digital communication is not available.

| | |
|---|---|
| Wind speed | 0 ... 20 mA or 4 ... 20 mA |
| Wind direction | 0 ... 20 mA or 4 ... 20 mA |

## Options and accessories

| | |
|---|---|
| Vaisala configuration tool and USB service cable SP | 220614 |
| Cable USB RS-232/RS-485 1.4 m USB M12 SP | 220782 |
| Cable 2 m shielded 8-pin M12 SP | 222287 |
| Cable 10 m shielded 8-pin M12 SP | 222288 |
| Cable 40 m shielded 12-pin, open end wires SP | 217020 |
| Cable USB with power supply RS-232 / 485 USB/ M12SP / 100-240 VAC | 263193SP |
| Cable 10 meter shielded 8-pin M12 | CBL210679 |
| Cable 50 m shielded 8-pin M12, open end wires | 245931 |
| Bushing and grounding accessory kit | 222109 |
| Mounting kit | 212792 |
| Mounting accessory between mounting kit and 60 mm tube | WMSFIX60 |
| Bird kit | 212793 |

## Operating environment

| | |
|---|---|
| Operating environment | Outdoor use |
| Operating temperature | −52 ... +60 °C (−60 ... +140 °F) |
| Storage temperature | −60 ... +70 °C (−76 ... +158 °F) |
| Operating humidity | 0 ... 100 %RH |
| Operating pressure | 500 ... 1100 hPa |
| Wind [1)] | 0 ... 60 m/s (0 ... 134 mph) |
| IP rating | Without mounting kit: IP65<br>With mounting kit: IP66 |

*1) Due to the measurement frequency used in the sonic transducers, RF interference in the 200 ... 400 kHz range can disturb wind measurement.*

## Mechanical specifications

| | |
|---|---|
| Dimensions (H × Ø) | 141 × 114 mm (5.48 × 4.49 in) |
| Weight | 510 g (1.12 lb) |
| **Materials** | |
| Radiation shield, top, and bottom parts | Polycarbonate +20 % fiberglass |
| Precipitation sensor plate | Stainless steel (AISI 316) |

## Compliance

| | |
|---|---|
| EU directives and regulations | LVD, EMC, RoHS |
| EMC compatibility | EN 61326-1, industrial environment<br>CISPR 32 / EN 55032, Class B |
| Environmental | IEC 60068-2-1, 2, 6, 14, 30, 31, 78<br>IEC 60529, VDA 621-415 |
| Maritime | IEC 60945 (Exposed)<br>DNV GL Type Examination Certificate No. TAA00000VF |
| Compliance marks | CE, RCM, RoHS, China RoHS, UKCA |

VAISALA

www.vaisala.com

Published by Vaisala | B211593EN-E © Vaisala Oyj 2022