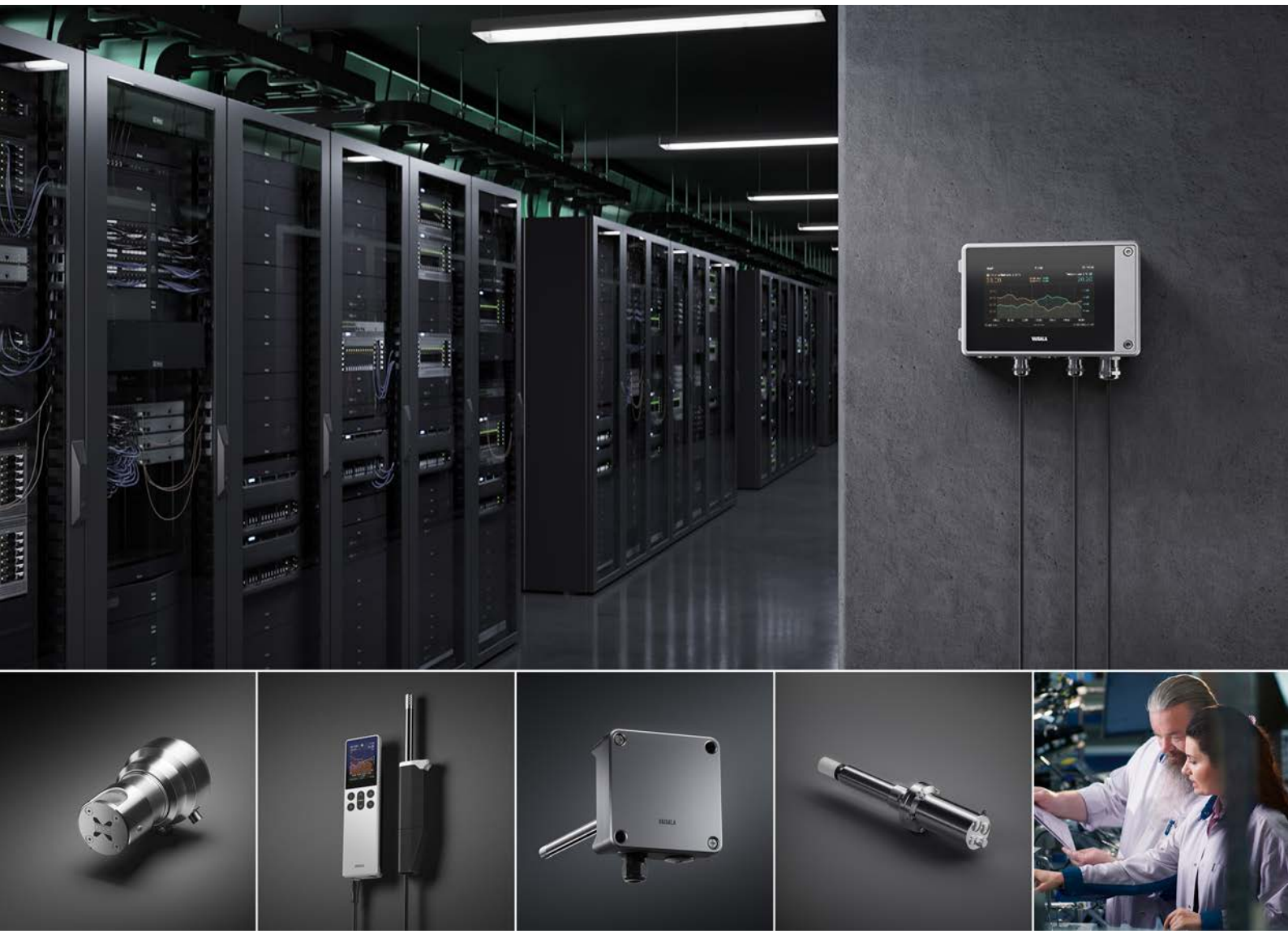
Product Catalog

Humidity · Temperature · Dew point · Carbon dioxide
Biogas quality · Moisture in oil · Hydrogen peroxide
Pressure · Liquid concentration · Weather · Service offering

INDUSTRIAL INSTRUMENTS



VAISALA

Instruments and intelligence for industrial needs

Vaisala Industrial Measurements

Vaisala's Industrial Measurements business area provides customers with visibility into their own processes. Our products provide them with accurate and reliable measurement data which enables them to make decisions for optimized industrial processes.

Heating, ventilation, and air-conditioning (HVAC)

Vaisala offers industry benchmark HVAC transmitters for measuring humidity, temperature, and carbon dioxide indoors and outdoors. Customers use these instruments to optimize heating ventilation and air conditioning controls, for example, in offices, hospitals, data centers, factories, and cooling towers. Our transmitters help in maintaining good indoor air quality and saving costs through improved efficiency.

Liquid measurements

Vaisala's cutting-edge Polaris™ process refractometers offer unparalleled reliability and performance in liquid concentration and density measurements for industrial manufacturing. Designed for seamless inline process control, our solutions are trusted across a wide range of demanding sectors, including pulp and paper, food and sugar production, semiconductors, pharmaceuticals, chemicals, oil refining, and petrochemicals.

Life Cycle Services

Our Life Cycle Services provide comprehensive care through the life cycle of our measurement instruments. As a trusted partner to our global customers, we enable sustainable decisions by maintaining the most accurate measurement data throughout the entire product and system life cycle.

This product catalog provides an overview of our products to help you select what best suits your needs. For more information, visit us at vaisala.com or contact us at vaisala.com/requestinfo. Product user documentation is available at docs.vaisala.com.

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VAISALA SERVICE OFFERING

VAISALA

Wind and weather sensor technologies for measurements in industrial applications

Wind and weather sensors

Vaisala ultrasonic wind sensors:

- Wind sensor with no moving parts
- Unique triangular design for accurate measurements from all directions
- Optional sensor heating available
- Maintenance free, no field calibration required
- Measurement range up to 90 m/s

Vaisala mechanical wind sensors:

- Accurate wind speed and direction sensors
- Fast and linear response
- Low measurement starting threshold
- Sensors with heating elements available for cold climates

Vaisala weather sensor:

- Measurement of the six essential weather parameters: wind speed and direction, liquid precipitation, barometric pressure, temperature, and relative humidity
- Feature proprietary Vaisala sensor technologies: WINDCAP®, RAINCAP®, HUMICAP®, and BAROCAP®

Vaisala's long history in wind and weather measurements started already in the 1930s from the development of a radiosonde to measure the conditions in the upper atmosphere. Today, Vaisala wind and weather instruments are used in dozens of applications and industries all over the world.

Industrial applications for wind and weather measurements

Wind and weather data are required in many activities across industries. For example, in power industry, the efficiency of power lines is a function of wind speed and direction.

Nuclear power plants require wind data for safety reasons to be able to model the dispersion of potentially radioactive leakages. In addition to nuclear power plants, also chemical factories need to gather wind data for dispersion monitoring.

Accurate outdoor measurements are essential in operating modern buildings. Processes such as free cooling, natural ventilation, and automated shading are dependent on real-time weather data.

Ventilation control in greenhouses also relies on localized weather data to ensure an optimized environment for plant growth.

Vaisala wind and weather instruments

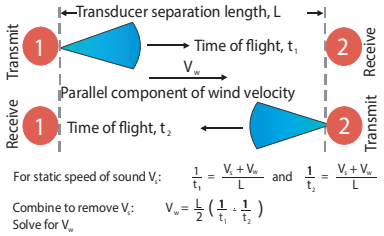
Vaisala manufactures wind and weather instruments for different applications, requirements and budgets. The wind sensor portfolio for industrial applications includes both mechanical and ultrasonic sensors. View the complete range of wind products at vaisala.com/en/products/weather-environmental-sensors/wind. Have a look at the multiparameter Vaisala Weather Transmitter WXT530 at vaisala.com/wxt530.

Vaisala sensor technologies for wind and rain measurements

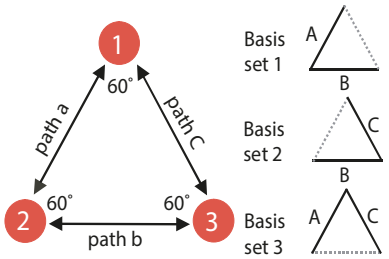
Vaisala WINDCAP Sensor

Vaisala WINDCAP Ultrasonic Wind Sensor uses ultrasound to determine wind speed and direction. The sensor has no moving parts, which makes it independent of the limitations of mechanical wind sensors such as friction, inertia, time constant, over-speeding, and starting threshold.

WINDCAP sensor features an array of three ultrasonic transducers oriented to form an equilateral triangle. Wind measurement is based on time of flight (TOF) of the sonic impulse – the time it takes for the signal to travel from one transducer to another. TOF is measured in both directions for each pair of transducer heads. Simple algebra allows solving for the parallel component of wind velocity independently of the static speed of sound.



The equilateral triangle configuration of the three transducers provides three possible sets of basis vectors. The combinations yield bi-directional measurements on the paths labeled A, B, and C. These measurements are used to determine the wind velocity components parallel to each of the three paths.



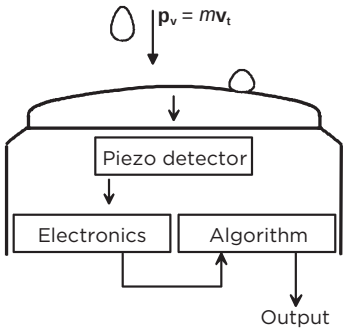
Vaisala RAINCAP Sensor

Vaisala RAINCAP Sensor is an acoustic sensor that measures the impact of individual raindrops on a smooth stainless steel surface using a piezoelectric detector. The sensor provides real time information on rain intensity, duration, and accumulated rainfall.

The RAINCAP sensor consists of a round stainless steel cover, approximately 90 mm in diameter mounted to a rigid frame. A piezoelectric detector is located beneath the cover.

Raindrops hit the RAINCAP sensor surface at terminal velocity, which is a function of the raindrop diameter. Rain measurement is based on acoustic detection of each individual rain drop as it impacts the sensor cover. Larger drops create a larger acoustic signal than smaller drops.

The piezoelectric detector converts the acoustic signals into voltages. Total rain is calculated from the sum of the individual voltage signals per unit time and the known surface area of the RAINCAP sensor. In addition, the intensity and duration of rain can be calculated.



Pv = vertical momentum
m = mass of drop
v_t = terminal velocity of drop

VAISALA

WA15 Wind Set

For high-performance wind measurement

Features

- High-performance wind measurement set
- Long and successful track record in meteorological applications
- Accurate wind speed and direction measurement
- Low measurement starting threshold
- Conical anemometer cups provide excellent linearity
- Heated shaft prevents bearings from freezing

WA15 is based on accurate sensors installed on a cross-arm. It is designed for demanding wind measurement applications.

With a proven track record of successful installations, Vaisala Wind Set WA15 has earned its reputation as the industry standard in the wind sensor market.

WA15 consists of Vaisala Anemometer WAA151, Vaisala Wind Vane WAV151, an optional cross-arm, and cabling.

Anemometer with excellent linearity

WAA151 is a fast-response, low-threshold anemometer. Three lightweight, conical cups mounted on the cup wheel provide excellent linearity over the entire operating range, up to 75 m/s (168 mph).

A wind-rotated chopper disc attached to the shaft of the cup wheel cuts an infrared light beam 14 times per revolution. This generates a pulse output from the phototransistor.

The output pulse rate is directly proportional to wind speed, for example, 246 Hz = 24.6 m/s (55 mph). For the highest accuracy, the characteristic transfer function must be used to compensate for starting inertia.

Sensitive wind vane

WAV151 is a counter-balanced, low-threshold, optoelectronic wind vane. Infrared LEDs and phototransistors are mounted on 6 orbits on each side of a 6-bit GRAY-coded disc. Turned by the vane, the disc creates changes in the code received by the phototransistors. The output code resolution is ±2.8°.

Heated bearings withstand cold weather

Heating elements in the shaft tunnels of both the anemometer and vane keep the bearings above freezing temperatures in cold climates.

Complete package available

The anemometer and vane are designed to be mounted on Vaisala cross-arms.

Technical Data

WAA151 measurement performance

Sensor/Transducer type	Cup anemometer/opto-chopper
Observation range	0.4–75 m/s (0.9–168 mph)
Starting threshold [1]	< 0.5 m/s (1.1 mph)
Distance constant	4.0 m (13 ft 1 in)
Transducer output	
0–75 m/s (0–168 mph)	0–750 Hz square wave
Characteristic transfer function	Uf (wind speed) = 0.328 + 0.101 × R (output pulse rate)
Transducer output level	
(I_{out} < +5 mA)	High state > U_{in} –1.5 V
(I_{out} > -5 mA)	Low state < 2.0 V
Accuracy within 0.4–60 m/s (0.9–134 mph)	
With characteristic transfer function (standard deviation)	±0.17 m/s (0.38 mph)
With simple transfer function U_f = 0.1 × R	±0.5 m/s (1.12 mph) [2]

1) *Measured with the cup wheel in position least favored by flow direction. The optimum position yields a < 0.35 m/s (0.8 mph) starting threshold.*
2) *Typical error vs. speed with the simple transfer function used.*

RANGE (m/s)	0-3	3-10	10-17	17-24	24-31	31-37	37-44	44-51	51-58	58-65
ERROR (m/s)	-0.4	-0.3	-0.2	-0.1	0.0	+0.1	+0.2	+0.3	+0.4	+0.5

WAA151 inputs and outputs

Electrical connections	MIL-C-26482 type, 6-wire cable
Cabling	6-wire cable through cross-arm
Recommended connector at cable end	Souriau UTS6JC10E6P
Operating power supply	U_{in} = 9.5–15.5 V DC, 20 mA, typical
Heating power supply	AC or DC 20 V, 500 mA, nominal
Settling time after power-up	< 30 µs

WAA151 operating environment

Operating temperature [1]	–50 ... +60 °C (–58 ... +140 °F)
Storage temperature	–60 ... +70 °C (–76 ... +158 °F)
Operating humidity	0–100 %RH
IP rating	IP65

1) *With shaft heating.*

WAA151 mechanical specifications

Dimensions (H × Ø)	240 × 90 mm (9.45 × 3.54 in)
Swept radius of cup wheel	91 mm (3.58 in)
Weight	570 g (1.26 lb)
Materials	
Housing	AlMgSi, gray anodized
Cup	PA, reinforced with carbon fiber

WA15 mechanical specifications

Junction box	125 × 80 × 57 mm (4.92 × 3.15 × 2.24 in)
Cross-arm length	800 mm (31.50 in)
Mounting to a pole mast with a nominal outside diameter	60 mm (2.36 in)

WAV151 measurement performance

Sensor/Transducer type	Optical code disc
Observation range at wind speed 0.4–75 m/s (0.9–168 mph)	0–360°
Starting threshold	< 0.4 m/s (0.9 mph)
Resolution	±2.8°
Damping ratio	0.19
Overshoot ratio	0.55
Delay distance	0.4 m (1 ft 4 in)
Accuracy	Better than ±3°
Output	6-bit parallel GRAY code
Transducer output level	
(I_{out} < +5 mA)	High state > U_{in} –1.5 V
(I_{out} > -5 mA)	Low state < 1.5 V

WAV151 inputs and outputs

Electrical connections	MIL-C-26482 type, 10-wire cable
Cabling	10-wire cable through cross-arm
Recommended connector at cable end	Souriau UTS6JC12E10P
Operating power supply	U_{in} = 9.5–15.5 V DC, 20 mA typical
Heating power supply	20 V AC or DC, 500 mA nominal
Settling time after power turn-on	< 100 µs

WAV151 operating environment

Operating temperature [1]	–50 ... +60 °C (–58 ... +140 °F)
Storage temperature	–60 ... +70 °C (–76 ... +158 °F)
Operating humidity	0–100 %RH
IP rating	IP65

1) *With shaft heating.*

WAV151 mechanical specifications

Dimensions (H × Ø)	300 × 90 mm (11.81 × 3.54 in)
Swept radius of vane	172 mm (6.77 in)
Weight	660 g (1.46 lb)
Materials	
Housing	AlMgSi, gray anodized
Vane	AISI 12, anodized

WA15 compliance

Compliance marks	CE, China RoHS
EU directives and regulations	RoHS Directive (2011/65/EU) as amended by 2015/863 EMC Directive (2014/30/EU)
Electromagnetic compatibility (EMC)	EMC 55032:2015, Electromagnetic compatibility of multimedia equipment - Emission requirements. Class B. EN 61326-1:2013, Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements.
Environmental	IEC/EN 63000:2018

VAISALA

WMT700 Ultrasonic Wind Sensor Series

WMT700 Series has been designed for professional use in meteorology, aviation, maritime, wind energy, and many other applications.

Vaisala WINDCAP® Ultrasonic Wind Sensor WMT700 Series is a robust and reliable ultrasonic anemometer. It measures surface wind, which is one of the key parameters for meteorology and aviation.

WMT700 series meets WMO CIMO Guide (WMO-No.8) and ICAO requirements.

Accurate and maintenance-free

WMT700 series has a durable full steel structure with welded arms, clear North indication, and one-point, quick bayonet-style mounting. It has no moving parts, and it is resistant to contamination and corrosion.

It measures accurately and produces reliable data in demanding wind conditions and climates without periodic or on-demand maintenance. Self-diagnostics and measurement validation are standard features. The 60-minute average is available for polar coordinates and vectors.

Measurement based on ultrasound

WMT700 series uses ultrasound to determine the horizontal wind speed and direction. The measurement is based on transit time, the time it takes for the ultrasound to travel from one transducer to another, depending on the wind speed.

The transit time is measured in both directions for a pair of transducer heads. Using 2 measurements for each of the 3 ultrasonic paths at 60° angles to each other, WMT700 computes the wind speed and direction.

The wind measurement is calculated in a way that completely eliminates the effects of altitude, temperature, and humidity.

Standard and heated models

WMT700 series operates with a power supply of 9 ... 36 V DC. For the heated model, an additional heating power supply of 24 ... 36 V DC is required.

Thermostatically controlled heaters in the transducer heads and arms of the heated model prevent build-up of freezing rain and snow. A model with a heated transducer, arms, and body is available for operation in the harshest and coldest environments.

In addition, accessories are available for mounting and connecting WMT700. To minimize interference from birds, a bird prevention kit is available.

TYPE APPROVED PRODUCT
DNV·GL
DNVGL.COM/AF

DNV GL TYPE EXAMINATION CERTIFICATE No. TAA00000U5

SGS C US
800226

Features

- WMO and ICAO compliant
- Data output rate 4 Hz and 8 Hz
- Stainless steel structure
- Maintenance-free
- 3-transducer layout provides accurate data
- Data format outputs: polar coordinates and vectors
- Fully compensates effects of temperature, humidity, and pressure
- Measurement range up to 90 m/s (201 mph)
- Heating up to 250 W
- IP66 and IP67
- Large transducers provide high ultrasound power
- Optional bird prevention kit
- Wind gust calculated according to WMO guidelines
- US National Weather Service and the FAA rely on Vaisala WINDCAP® technology

Technical data

Wind speed measurement performance

Observation range	WMT701: 0–40 m/s (89 mph) WMT702: 0–65 m/s (145 mph) WMT703: 0–75 m/s (168 mph) WMT704: 0–90 m/s (201 mph)
Starting threshold	0.01 m/s (0.0223 mph)
Resolution	0.01 m/s (0.0223 mph)
Response time	250 ms
Accuracy	0–75 m/s (168 mph): ±0.1 m/s (0.2 mph) or 2 % of reading, whichever is greater 75–90 m/s (201 mph): ±5 % of reading

Wind direction measurement performance

Observation range	0–360°
Starting threshold	0.1 m/s (0.2 mph)
Resolution	0.01°
Response time	250 ms
Accuracy	±2°

Powering specifications

Operating voltage	9–36 V DC (absolute max. 40 V DC) [1]
Heating voltage	24–36 V DC (absolute max. 40 V DC) [1]
Heating power supply requirement [2]	
Heated transducers	Average 32 W Peak 40 W
Heated transducers and arms	Average 152 W Peak 200 W
Heated transducers, arms, and body	Average 252 W Peak 350 W at 24 V DC

1) *In maritime environments, the normal input voltage ranges are: operating voltage 12–30 V DC (−25 … +30 %) and heating voltage 24–30 V DC (−10 … +30 %), as defined in the maritime standard IEC 60945.*
2) *The actual power consumption depends on the temperature.*

Messaging specifications

Readout update interval	4 Hz (default) and 8 Hz (optional)
Units available	m/s, knots, mph, km/h, V, mA, Hz
Operating mode	Automatic message or poll mode
Sonic temperature	Celsius degrees

Mechanical specifications

Dimensions (H × W × Ø [1])	348 × 250 × 285 mm (13.70 × 9.84 × 11.22 in)
Weight	1.8 kg (4.0 lb)
Materials	
Body and arms, mounting kit	Stainless steel AISI 316
Transducers	Silicone
Connector housing surface	Nickel-plated brass

1) *Diameter of area covered by transducers.*

Analog outputs

Wind speed	Voltage, current, frequency
Wind direction	Voltage, current, potentiometer

Operating environment

Heating [1]	0 W, 30 W, 150 W, or 250 W
Operating temperature [1]	−10 … +60 °C (+14 … +140 °F) −40 … +60 °C (−40 … +140 °F) −55 …+70 °C (−67 …+158 °F)
Storage temperature	−60 … +80 °C (−76 … +176 °F)
IP rating	IP66 IP67

1) *For freezing conditions, select appropriate combination of heating and temperature ranges.*

Digital outputs

Communication interfaces	COM1: RS-485 COM2: RS-485, RS-422, RS-232, SDI-12
Communication profiles	WMT700, WS425 ASCII, NMEA Standard and Extended (version 0183), SDI-12 (version 1.3), WS425 ASOS, ROSA MES 12, customized
Bit rate	300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200
Available averages	Max. 3600 s

Compliance

EU directives and regulations	EMC Directive (2014/30/EU) RoHS Directive (2011/65/EU) as amended by 2015/863 REACH Regulation (EC 1907/2006)
EMC immunity	IEC 61326-1:2013, IEC 60945
EMC emissions	CISPR 32 / EN 55032, Class B
Environmental	IEC 60068-2-1, 2, 6/34, 30, 31, 67, 78, IEC 60529 VDA 621-415
Maritime	IEC 60945:2002 + IEC 60945/ Cor1:2008, DNVGL-CG-0339
Electrical safety	UL 61010-1 CAN/CSA C22.2 No. 61010-1-12
Application standards	EN 15518-3:2023, Winter maintenance equipment - Road weather information systems - Part 3: Requirements on measured values of stationary equipment
Compliance marks	CE, China RoHS, RCM, UKCA
Listing marks	SGS (USA and Canada)

VAISALA

WXT530 Weather Transmitter 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.*

TYPE APPROVED PRODUCT
DNV·GL
DNVGL.COM/AF

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) ±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 ±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 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^2h (1 hits/in^2h), 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) Typical: 3.5 mA at 12 V DC (typical measuring intervals) Maximum: 15 mA at 6 V DC (constant measurement of all parameters)
Heating voltage	DC, AC, or full-wave rectified AC 12–24 V DC (−10 … +30 %) 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, ASCII automatic and polled, 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
Electromagnetic compatibility (EMC)	EN 61326-1, industrial environment CISPR 32 / EN 55032, Class B
Environmental	IEC 60068-2-1, 2, 6, 14, 30, 31, 78 IEC 60529, VDA 621-415
Maritime	IEC 60945 (Exposed) DNV GL Type Examination Certificate No. TAA00000VF
Compliance marks	CE, RCM, RoHS, China RoHS, UKCA