VAISALA

ПРОИЗВОДСТВО МЕТЕОРОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

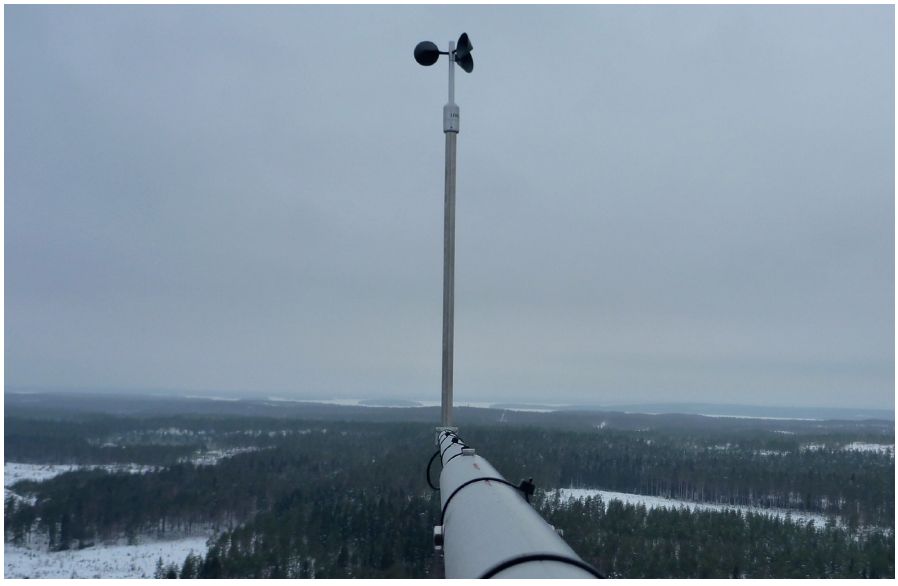
СИСТЕМЫ ИЗМЕРЕНИЯ ВЕТРА

WTS 140, 150, 250, 520, 700

ТЕХНИЧЕСКИЕ ХАРАКТЕРИСТИКИ

Vaisala Wind Tower System WTS140

Wind Measurement System for Complex Terrain



Features / Benefits

- System is designed specifically for Class B conditions (complex terrain)
- Fulfills all IEC standards for wind monitoring
- Measnet calibrated wind sensor
- Powerful data logger to collect and store information
- Wind sensor accurately measures horizontal wind speed with excellent cosine response
- Continuity of data
- Excellent choice when financing requires strict reporting
- System is flexible and can be customized to meet your needs with additional sensors or services

Overview

The Vaisala WTS140 wind measurement system is designed for accurately monitoring wind conditions in complex terrain using mechanical sensor technology. The WTS140 system fulfills the IEC61400-12-1 requirements, and is the best choice for demanding terrain or Class B site conditions. The sensor package is a solid choice when terrain is an issue, and financing requires strict guidelines. When financing your wind farm, the WTS140 will provide reliable and trustworthy data for your investment.

A Complete and Reliable Measurement System

Vaisala's core expertise is weather measurement. We research, design, develop and manufacture weather sensors. Vaisala has weather installations in all parts of the world, in every climate, and we've even sent a weather sensor to Mars! We have applications in many industry fields, including Meteorology, Energy, Airports, Roadways, and Maritime.

The WTS140 system was developed specifically for site assessment and power curve verification in complex terrain. The main component of the system is the Thies first class anemometer, a high-performing sensor designed for complex terrain. Along with the Measnet calibrated wind sensors, the WTS140 standard package comes with:

- Sensor booms and supports for lattice towers
- All necessary cabling
- Data logger for collecting measurements
- Your option of 1, 2 or 3 measurement levels for 60, 80 or 100 meter towers
- Vaisala's combined air temperature and relative humidity sensor at the top measurement level
- Precision barometric pressure sensor
- Lightning surge protection

The system can be equipped with an additional Vaisala air temperature and humidity sensor, pyranometer, and/or Vaisala ultrasonic wind sensor. Standard power supply options are mains power or external 24VDC feed. The power system can accommodate a battery charger for optional solar panels.

Convenient Access to Your Measurement Data

Vaisala's WTS system collects, stores and transmits data utilizing a fully digital design, which minimizes interference and results in a

Vaisala Wind Tower System WTS140

continuous data set. Extensive quality checks in the sensors and data logger ensure high quality data. Vaisala's powerful data logger reads the signals from the sensors and stores the data in internal memory for later download to a computer. A 2GB CF-memory card able to store up to 1 year of 10 minute wind data and other observations is standard with the WTS140 system.

Wind and weather data is transmitted from the site to either Vaisala for managing, or directly to the customer. Data transfer from the site to your office is easy using a flash memory to collect data directly from the site, or through GPRS cellular service remotely.

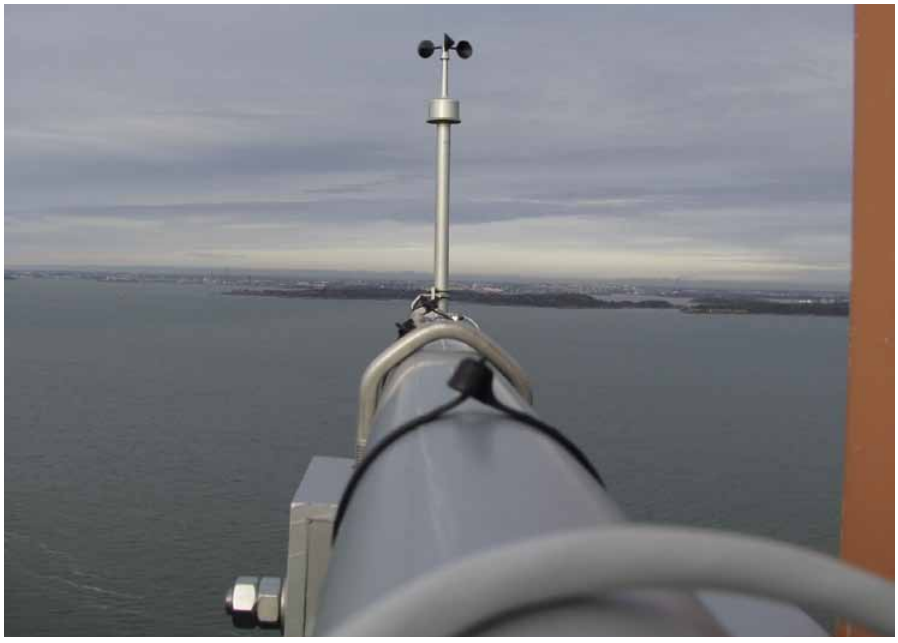
Vaisala Service

Service packages from Vaisala help you manage data collection, full system monitoring, and data display. We can collect, host, monitor, inspect and distribute the data according your needs. Two standard service packages are available, or we can customize a service package to meet your needs.

System Components	Equipment	Specifications	Description
Wind	Thies anemometer	Thies range is 0.3 to 75 m/s and 0 to 360º Thies accuracy is < 3% of measured value or < 0.3 m/s and 1.5º for direction Thies anemometer Measnet calibrated accuracy is ± 0.1 m/s (4 to 16 m/s) Class B, classification index B 3.0	Thies first class sensor for measurement of wind speed and direction
Relative humidity, temperature, dew point	HMP110	Relative humidity range is 0 to 100% (± 2%) Temperature range is -40°C to +80°C (± 0.2°C) Dew point range is -40 °C to +80 °C	Humidity and temperature probe
Barometric pressure	BARO-1QML	Pressure range is 500 to 1100 hPa, ± 0.2 hPa	Barometric pressure sensor
Sensor booms		By default 4.5 m extruded aluminium, 100 cm sensor support tube	Telescopic booms with hinge for easy maintenance access
Automatic Weather Station	WTE301	QML201C data logger, 4-band GSM/GPRS modem Mains/Solar or external 24VDC power supply Power consumption, measurement system: 0.5A (12VDC, 3 level system) Heater power consumption: 10A (24VDC, 3 level system) Internal batteries 52Ah (12VDC, estimated 9 days backup for measurement)	Integrated automatic weather station one compact enclosure. All external wiring uses connectors for easy installation.
Optional components	WMT702	WMT702 range is 0 to 65 m/s and 0 to 360º WMT700 Measnet calibrated accuracy is better than ± 0.1 m/s (4 to 16 m/s)	Ultrasonic wind sensor
	Metek uSonic-3 Basic	3D ultrasonic wind sensor, range ±50 m/s three axis	3D ultrasonic wind sensor
	HMP155	0 to 100% Relative Humidity, -80 to +60°C for temperature	Humidity and temperature probe
	CMP3	300 to 2800 nm / 0 to 2000 W/m^2	Solar radiation sensor (pyranometer)

Vaisala Wind Tower System WTS150

Economical Wind Measurement System for Uniform Terrain



Features / Benefits

- System is designed specifically for Class A conditions (uniform terrain)
- Measnet calibrated, Class 1 wind sensor
- Powerful data logger to collect and store information
- Continuity of data, especially if system is equipped with Vaisala's ultrasonic wind sensor at the top measurement level
- Vaisala service package to collect, monitor and report your observation data
- System is flexible and can be customized to meet your needs with additional sensors or services

Overview

The Vaisala WTS150 is an economical wind measurement system that utilizes mechanical wind sensors for collecting wind data in an area of uniform terrain. The WTS150 is designed for site assessment in IEC Class A conditions, and provides accurate data in all climate conditions.

Weather Expertise

Vaisala's core expertise is weather measurement. We research, design, develop and manufacture weather sensors. Vaisala has weather installations in all parts of the world, in every climate, and we've even sent a weather sensor to Mars! We have applications in many industry fields, including Meteorology, Energy, Airports, Roadways, and Maritime.

Compliant System, Competitively Priced

The WTS150 wind measurement system is the most cost effective solution for a compliant system. It is built around Vaisala's WAA151 Class 1 anemometer, which is Measnet calibrated. Additional equipment as part of the system includes:

- Sensor booms and supports for lattice towers
- All necessary cabling
- Data logger for collecting measurements
- Your option of 1, 2 or 3 measurement levels for 60, 80 or 100 meter towers
- Vaisala's combined air temperature and relative humidity sensor at the top measurement level
- Precision barometric pressure sensor
- Lightning surge protection

A feature of this system is not only do you receive the Measnet calibrated, Class 1 mechanical wind sensor, but you also have the option to add an ultrasonic wind sensor at the top measurement level, while still remaining cost effective. Anticipating the addition of ultrasonic sensors to the IEC standard, you can begin using them along with your mechanical sensors. Using both sensor technologies will allow you to fill in data gaps and receive continuous wind measurement data.

Vaisala Wind Tower System WTS150

Standard power supply options are mains power or external 24VDC feed. The power system can accommodate a battery charger for optional solar panels.

Convenient Access to Your Measurement Data

Vaisala's WTS system collects, stores and transmits data utilizing a fully digital design, which minimizes interference and results in a continuous data set. Extensive quality checks in the sensors and data logger ensure high quality data. Vaisala's powerful data logger reads the signals from the sensors and stores the data in internal memory for later download to a computer. A 2GB CF-memory card able to store up to 1 year of 10 minute wind data and other observations is standard with the WTS150 system.

Wind and weather data is transmitted from the site to either Vaisala for managing, or directly to the customer. Data transfer from the site to your office is easy using a flash memory to collect data directly from the site, or through GPRS cellular service remotely.

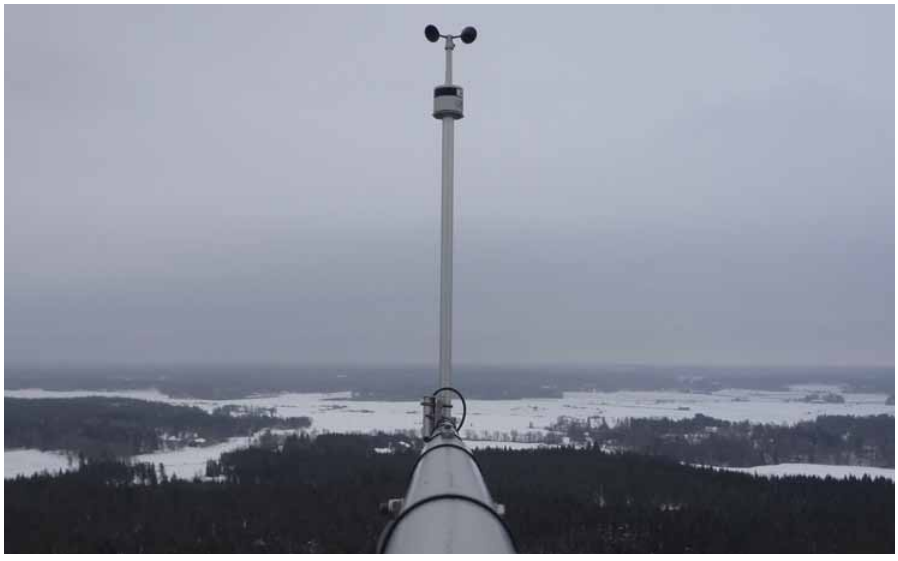
Vaisala Service

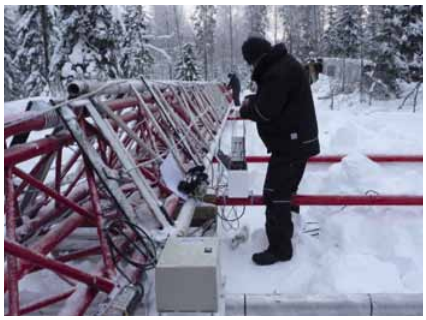
Service packages from Vaisala help you manage data collection, full system monitoring, and data display. We can collect, host, monitor, inspect and distribute the data according your needs. Two standard service packages are available, or we can customize a service package to meet your needs.

System components	Equipment	Specifications	Description
Wind	WAA151	WAA151 range is 0.4 to 75 m/s WAA151 accuracy is ± 0.5 m/s Class A, classification index A 1.7 WAA151 Measnet calibrated accuracy is ± 0.1 m/s (4 to 16 m/s)	WAA: High performance cup anemometer for measurement of wind speed (Measnet calibrated) WAV: Wind vane for measurement of wind direction
	WAV151	WAV151 range is 0 to 360° WAV151 accuracy is better than ± 3°	
Relative humidity, temperature, dew point	HMP110	Relative humidity range is 0 to 100% (± 2%) Temperature range is -40°C to +80°C (± 0.2°C) Dew point range is -40 °C to +80 °C	Humidity and temperature probe
Barometric pressure	BARO-1QML	Pressure range is 500 to 1100 hPa, ± 0.2 hPa	Barometric pressure sensor
Automatic Weather Station	WTE301	QML201C data logger, 4-band GSM/GPRS modem Mains/Solar or external 24VDC power supply Power consumption, measurement system: 0.4A (12VDC, 3 level system) Heater power consumption: 5A (24VDC, 3 level system) Internal batteries 52Ah (12VDC, estimated 11 days backup for measurement)	Integrated automatic weather station in one compact enclosure. All external wiring uses connectors for easy installation.
Optional components	WMT702	WMT702 range is 0 to 65 m/s and 0 to 360° WMT700 Measnet calibrated accuracy is better than ± 0.1 m/s (4 to 16 m/s)	Ultrasonic wind sensor
	Metek uSonic-3 Basic	3D ultrasonic wind sensor, range ±50 m/s three axis	3D ultrasonic wind sensor
	HMP155	0 to 100% Relative Humidity, -80 to +60°C for temperature	Humidity and temperature probe
	CMP3	300 to 2800 nm / 0 to 2000 W/m^2	Solar radiation sensor (pyranometer)

Vaisala Wind Tower System WTS250

Cold Climate Measurement System with Fully Heated Mechanical Wind Sensors





Features / Benefits

- System is designed specifically to monitor wind conditions in cold climates
- Fully heated mechanical wind speed and direction sensors – heating in cups, vane, sensor bodies and bearings
- Measnet calibrated Vaisala WAA252 mechanical wind sensor
- Powerful data logger to collect and store information
- Continuity of data, especially if system is equipped with Vaisala's ultrasonic wind sensor WMT700 at the top measurement level
- Service package managed by Vaisala where weather experts are monitoring your data, not a third party
- System is flexible and can be customized to meet your needs with additional sensors or services

Overview

The Vaisala WTS250 measurement system is the new standard for monitoring wind conditions in harsh, cold climates, and/or where icing occurs frequently during the winter season. Its fully heated sensors have proven their performance and reliability in the most demanding environments around the world.

Vaisala's core expertise is weather measurement. We research, design, develop and manufacture weather sensors and have extensive experience designing and testing sensors for use in snow and ice conditions and extreme temperatures. We have applications in a variety of industries where having accurate, continuous weather data is critical in order to properly plan and keep operations running smooth. These applications include Energy transmission, Airports, and Roadway maintenance.

A Complete and Reliable Measurement System

The WTS250 utilizes Vaisala's fully heated WAA252 mechanical wind sensors. These sensors are designed for harsh climates, providing the best data results possible during icing conditions. The WAA252 mechanical wind sensor is Measnet calibrated and contains heating in the cups, sensor bodies and bearings, allowing you to receive continuous wind speed data. The wind sensor can be considered a Class 1 sensor, based on its design, aerodynamics and specifications. The WTS 250 system also includes:

- Sensor booms and supports for lattice towers
- All necessary cabling
- Data logger for collecting measurements
- Your option of 1, 2 or 3 measurement levels for 60, 80 or 100 meter towers
- Vaisala's combined air temperature and relative humidity sensor at the top measurement level
- Precision barometric pressure sensor
- Lightning surge protection

With the WTS250 system you also have the option to add Vaisala's WMT700 ultrasonic wind sensor at the top measurement level. Using both sensor technologies will allow you to fill in data gaps, and receive as much continuous wind measurement data as possible, no matter how extreme the weather gets.

Vaisala Wind Tower System WTS250

Heating of the system requires mains power to operate effectively in cold conditions, or customer-supplied stand alone power can be utilized.

Convenient Access to Your Measurement Data

Vaisala's WTS system collects, stores and transmits data utilizing a fully digital design, which minimizes interference and results in a continuous data set. Extensive quality checks in the sensors and data logger ensure high quality data. Vaisala's powerful data logger reads the signals from the sensors and stores the data in internal memory for later download to a computer. A 2GB CF-memory card able to store up to 1 year of 10 minute wind data and other observations is standard with the WTS250 system.

Wind and weather data is transmitted from the site to either Vaisala for managing, or directly to the customer. Data transfer from the site to your office is easy using a flash memory to collect data directly from the site, or through GPRS cellular service remotely.

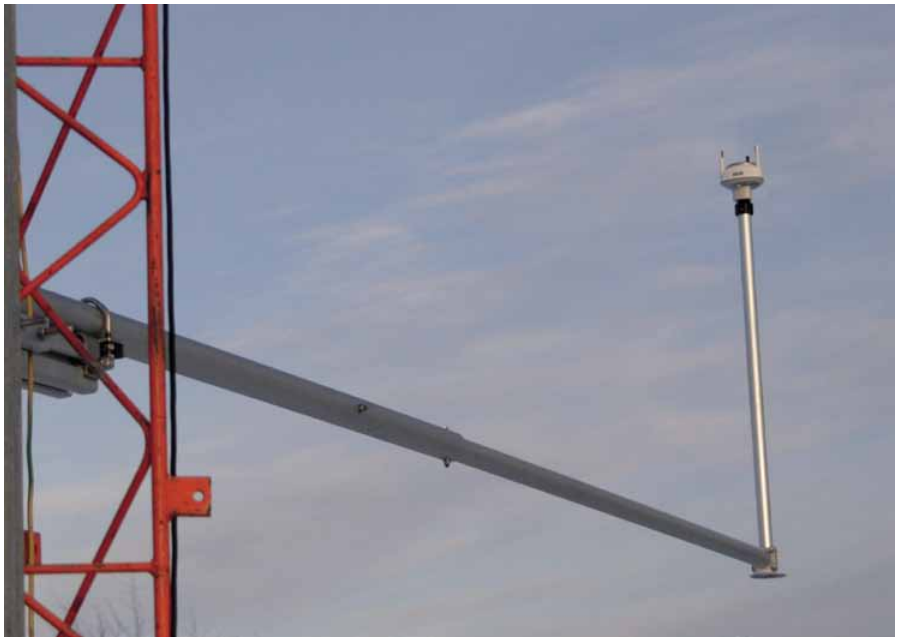
Vaisala Service

Service packages from Vaisala help you manage data collection, full system monitoring, and data display. We can collect, host, monitor, inspect and distribute the data according your needs. Two standard service packages are available, or we can customize a service package to meet your needs.

System Components	Equipment	Specifications	Description
Wind	WAA252	WAA252 range is 0.4 to 75 m/s WAA252 accuracy is ± 0.5 m/s WAA252 Measnet calibrated accuracy is ± 0.1 m/s (4 to16 m/s)	WAA: High performance cup anemometer for measurement of wind speed (Measnet calibrated)
	WAV252	WAV252 range is 0 to 360º WAV252 accuracy is better than ± 3º	WAV: Wind vane for measurement of wind direction
Relative humidity, temperature, dew point	HMP110	Relative humidity range is 0 to 100% (± 2%) Temperature range is -40°C to +80°C (± 0.2°C) Dew point range is -40 °C to +80 °C	Humidity and temperature probe
Barometric pressure	BARO-1QML	Pressure range is 500 to 1100 hPa, ± 0.2 hPa	Barometric pressure sensor
Automatic Weather Station	WTE301	QML201C data logger, 4-band GSM/GPRS modem, external 24VDC power supply required Power consumption, measurement system: 0.4A (12VDC, 3 level system) Heater power consumption: 15A (24VDC, 3 level system) Internal batteries 52Ah (12VDC, estimated 11 days backup for measurement)	Integrated automatic weather station in one compact enclosure. All external wiring uses connectors for easy installation.
Optional components	WMT702	WMT702 range is 0 to 65 m/s and 0 to 360º WMT700 Measnet calibrated accuracy is better than ± 0.1 m/s (4 to 16 m/s)	Ultrasonic wind sensor
	Metek uSonic-3 Basic	3D ultrasonic wind sensor, range ±50 m/s three axis	3D ultrasonic wind sensor
	HMP155	0 to 100% Relative Humidity, -80 to +60°C for temperature	Humidity and temperature probe
	CMP3	300 to 2800 nm / 0 to 2000 W/m^2 Power supply and telemetry options available upon request	Solar radiation sensor (pyranometer)

Vaisala Wind Tower System WTS520

Cost Effective Wind Measurement System with Ultrasonic Wind Sensors



Features / Benefits

- Economical wind measurement system that utilizes ultrasonic wind sensor technology
- Low life-cycle costs
- Low maintenance wind sensor; no moving parts
- Vaisala's WMT52 ultrasonic sensor eliminates over-speeding
- Powerful data logger to collect and store information
- Continuous data collection
- Service package to collect and manage wind data and supply proper reporting
- System is flexible and can be customized to meet your needs with additional sensors or services

Overview

The Vaisala WTS520 is an economical wind measurement system for monitoring conditions using ultrasonic wind sensor technology. The WTS520 is a great choice for existing wind farm operations and the ultrasonic sensors provide maintenance-free operations in non-freezing conditions.

Reliable Measurement System with Ultrasonics

Vaisala's core expertise is weather measurement. We research, design, develop and manufacture weather sensors, including several versions of ultrasonic wind sensors. The WTS520 is built around Vaisala's WMT52 ultrasonic wind sensor. This sensor has one of the lowest life-cycle costs in the industry. Ultrasonic sensors are more sensitive to changes in wind speed and eliminate over-speeding. The WMT52 sensor provides reliable sensing without any moving parts, giving you stable measurements over time and low operating costs. The WTS520 standard wind measurement system also includes:

- Sensor booms and supports for lattice towers
- All necessary cabling
- Data logger for collecting measurements
- Your option of 1, 2 or 3 measurement levels for 60, 80 or 100 meter towers
- Vaisala's combined air temperature and relative humidity sensor at the top measurement level
- Precision barometric pressure sensor
- Lightning surge protection

The system can be equipped with an additional Vaisala air temperature and humidity sensor and pyranometer. Standard power supply options are mains power or external 24VDC feed. The power system can accommodate a battery charger for optional solar panels.

Convenient Access to Your Measurement Data

Vaisala's WTS system collects, stores and transmits data utilizing a fully digital design, which minimizes interference and results in a continuous data set. Extensive quality checks in the sensors and data logger ensure high quality data. Vaisala's powerful data logger reads the signals from the sensors and stores the data in internal memory for later download to a computer. A 2GB CF-memory card able to store up to 1 year of 10 minute wind data and other observations is standard with the WTS520 system.

Vaisala Wind Tower System WTS520

Wind and weather data is transmitted from the site to either Vaisala for managing, or directly to the customer. Data transfer from the site to your office is easy using a flash memory to collect data directly from the site, or through GPRS cellular service remotely.

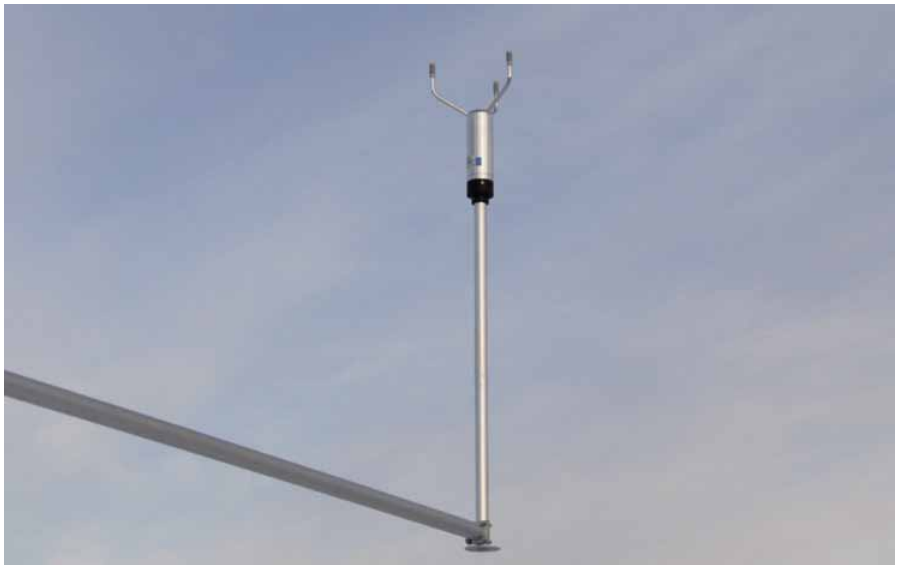
Vaisala Service

Service packages from Vaisala help you manage data collection, full system monitoring, and data display. We can collect, host, monitor, inspect and distribute the data according your needs. Two standard service packages are available, or we can customize a service package to meet your needs.

System Components	Equipment	Specifications	Description
Wind	WMT52	WMT52 range is 0 to 60 m/s and 0 to 360° WMT52 accuracy is ± 0.3 m/s or ±3%, whichever is greater and ±3° for direction	Ultrasonic wind sensor for measurement of wind speed and direction
Relative humidity, temperature, dew point	HMP110	Relative humidity range is 0 to 100% (± 2%) Temperature range is -40°C to +80°C (± 0.2°C) Dew point range is -40 °C to +80 °C	Humidity and temperature probe
Barometric pressure	BARO-1QML	Pressure range is 500 to 1100 hPa, ± 0.2 hPa	Barometric pressure sensor
Automatic Weather Station	WTE301	QML201C data logger, 4-band GSM/GPRS modem Mains/Solar or external 24VDC power supply Power consumption, measurement system: 0.25A (12VDC, 3 level system) Heater power consumption: 2A (24VDC, 3 level system) Internal batteries 52Ah (12VDC, estimated two weeks backup for measurement)	Integrated automatic weather station in one compact enclosure. All external wiring uses connectors for easy installation.
Optional components	HMP155	0 to 100% for Relative Humidity, -80 to +60°C for temperature	Humidity and temperature probe
	CMP3	300 to 2800 nm / 0 to 2000 W/m^2 Stand alone power supply and telemetry options available upon request	Solar radiation sensor (pyranometer)

Vaisala Wind Tower System WTS700

High Performance Wind Measurement System with Ultrasonic Wind Sensors



Overview

The Vaisala WTS700 is a state of the art wind measurement system for all needs in professional wind power applications. Its Measnet calibrated ultrasonic wind sensors are a perfect choice for conditions where no compromises in measurement accuracy are accepted.

High Performance Measurement System with Investment Grade Ultrasonics

The WTS700 wind measurement system utilizes Vaisala's Measnet calibrated WMT700 ultrasonic wind sensor to produce highly accurate wind data for use in all wind farm applications. Although ultrasonic sensors are still being considered as a standard option for IEC specifications, Vaisala has obtained wind tunnel tests and data from deployed meteorological wind towers in order to prove that ultrasonic sensors provide more consistent and higher quality data than mechanical sensors. Measnet calibrated wind tunnel tests show that issues with poor azimuth response are no longer valid with modern design, including Vaisala's WMT700. Better measurement performance from the ultrasonic sensors produces high quality data for analysis, and the continuous data availability reduces uncertainty of the dataset – investment grade measurements!

The WMT700 sensor provides accurate, reliable sensing without any moving parts. Heated versions are available and the sensor detects both wind speed and direction from a single sensor, which means less booms are required for wind vanes. The WTS700 wind measurement system boasts the Measnet calibrated WMT700 ultrasonic wind sensors, and also includes:

- Sensor booms and supports for lattice towers
- All necessary cabling
- Data logger for collecting measurements
- Your option of 1, 2 or 3 measurement levels for 60, 80 or 100 meter towers
- Vaisala's combined air temperature and relative humidity sensor at the top measurement level
- Precision barometric pressure sensor
- Lightning surge protection built into the WMT700 ultrasonic wind sensor

The system can be equipped with an additional Vaisala air temperature and humidity sensor and pyranometer. Standard power supply options are mains power or external 24VDC feed. The power system can accommodate a battery charger for optional solar panels. Ultrasonic

Features / Benefits

- High performance wind measurement system with ultrasonic wind sensor technology
- Excellent choice when no compromises in data can be accepted
- Professional system for use in any climate in any part of the world
- Ultrasonic sensor can be mounted upside down to eliminate measurement disruptions from birds and to utilize gravity to clear snow/ice from the measurement paths
- Proven accuracy and design – wind tunnel and field tested
- Measnet calibrated WMT700 ultrasonic wind sensor
- All-in-one sensor reduces the need for extra booms for wind vanes, saving you costs
- Low life-cycle costs
- Vaisala's WMT700 ultrasonic sensor eliminates over-speeding and is not affected by vertical wind components
- Powerful data logger to collect and store information
- Continuous data collection

Vaisala Wind Tower System WTS700

wind sensors require additional power, but Vaisala is making every effort possible to reduce consumption, researching ways to make the sensor as efficient as possible.

Convenient Access to Your Measurement Data

Vaisala's WTS system collects, stores and transmits data utilizing a fully digital design, which minimizes interference and results in a continuous data set. Extensive quality checks in the sensors and data logger ensure high quality data. Vaisala's powerful data logger reads the signals from the sensors and stores the data in internal memory for later download to a computer. A 2GB CF-memory card able to store up to 1 year of 10 minute wind data and other observations is standard with the WTS700 system.

Wind and weather data is transmitted from the site to either Vaisala for managing, or directly to the customer. Data transfer from the site to your office is easy using a flash memory to collect data directly from the site, or through GPRS cellular service remotely.

Vaisala Service

Service packages from Vaisala help you manage data collection, full system monitoring, and data display. We can collect, host, monitor, inspect and distribute the data according your needs. Two standard service packages are available, or we can customize a service package to meet your needs.

System Components	Equipment	Specifications	Description
Wind	WMT702	WMT702 range is 0 to 65 m/s and 0 to 360° WMT702 accuracy is ± 0.2 m/s or 3% of reading, whichever is greater and ± 2° for direction WMT700 Measnet calibrated accuracy is better than ± 0.1 m/s (4 to 16 m/s)	Ultrasonic wind sensor for measurement of wind speed and direction Heating options: 1) Transducers 2) Transducers and arms
Relative humidity, temperature, dew point	HMP110	Relative humidity range is 0 to 100% (± 2%) Temperature range is -40°C to +80°C (± 0.2°C) Dew point range is -40 °C to +80 °C	Humidity and temperature probe
Barometric pressure	BARO-1QML	Pressure range is 500 to 1100 hPa, ± 0.2 hPa	Barometric pressure sensor
Automatic Weather Station	WTE301	QML201C data logger, 4-band GSM/GPRS modem, Mains/Solar or external 24VDC power supply Power consumption, measurement system: 0.7A (12VDC, 3 level system) Heater power consumption: 30A (24VDC, 3 level system) Internal batteries 52Ah (12VDC, estimated 5 days backup for measurement)	Integrated automatic weather station in one compact enclosure. All external wiring uses connectors for easy installation.
Optional components	Metek uSonic-3 Basic	3D ultrasonic wind sensor, range ±50 m/s three axis	3D ultrasonic wind sensor
	HMP155	0 to 100% for Relative Humidity, -80 to +60°C for temperature	Humidity and temperature probe
	CMP3	300 to 2800 nm / 0 to 2000 W/m²	Solar radiation sensor (pyranometer)
		Stand alone power supply and telemetry options available upon request	

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ПРОИЗВОДСТВО МЕТЕОРОЛОГИЧЕСКОГО ОБОРУДОВАНИЯ

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Тюмень (3452)66-21-18
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