WS501-UMB & WS510-UMB

Applications

Meteorological Observation
Hydro-Meteorological Monitoring
Solar Energy
Wind Energy
Road Weather Monitoring
Aviation Weather Monitoring
Railway Weather Monitoring
Building Automation

Compact All-in-One Weather Sensor

Automatic weather station

Intelligent measurement transducers with digital interface for environmental applications
Designed to measure: Air temperature/pressure, relative humidity, solar irradiance, and wind direction/speed
One external temperature or rain sensor is connectable
Maintenance-free operation – no moving parts that can wear out
Open communication protocol

All-in-one station

All-in-one housing concept of a compact weather sensor combining 6 measurement parameters in one housing with only one cable connection. Built-in data pre-processing, universal interfaces and selectable output protocols.

Integrated high-quality pyranometer

The WS501 and the WS510 come with integrated pyranometers from specialized manufacturer Kipp & Zonen for measuring solar irradiance. The WS510 is the first and only compact weather sensor with a secondary standard CMP10 pyranometer, the WS501 has a CMP3.

Compliant with ISO/IEC 61724-1

Ventilated temperature and humidity measurement according to international standards for solar monitoring on PV plants. Integrated heater can be switched on in risk of frost.

Protocols and interfaces

Easy integration into any SCADA system. Communicates via RS-485 interface in Modbus® and various other protocols. Compatible with many commercially available dataloggers and PLS systems.

Technical Specifications

	WS501-UMB	WS510-UMB
Article number	8375.U01	8375.U13
Dimensions	Ø 150 mm, height 332 mm	Ø 150 mm, height 376 mm
Weight	1.5 kg	1.5 kg
Interface	RS-485, 2-wire, half-duplex	RS-485, 2-wire, half-duplex
Power supply	11 ... 32 VDC	11 ... 32 VDC
Power supply	5 ...11 VDC (electronics with limited precision of measurements)	
Power supply	24 VDC +/- 10% (heater)	24 VDC +/- 10% (heater)
Power consumption	20 VA (heater)	20 VA (heater)
Operating temperature	-50 ... 60 °C (with heater)	-50 ... 60 °C (with heater)
Operating rel. humidity	0 ... 100 % RH	0 ... 100 % RH
Protection level housing	IP66	IP66
Mast mounting suitable for	Mast diameter 60 ... 76 mm	Mast diameter 60 ... 76 mm
Cable length	10 m	10 m
Temperature		
Principle	NTC	NTC
Measuring range	-50 ... 60 °C	-50 ... 60 °C
Unit	°C	°C
Accuracy	±0.2 °C (-20 ... 50 °C), otherwise ±0.5 °C (> -30 °C)	±0.2 °C (-20 ... 50 °C), otherwise ±0.5 °C (> -30 °C)
Relative humidity		
Principle	Capacitive	Capacitive
Measuring range	0 ... 100 % RH	0 ... 100 % RH
Unit	% RH	% RH
Accuracy	±2 % RH	±2 % RH
Air pressure		
Principle	MEMS capacitive	MEMS capacitive
Measuring range	300 ... 1200 hPa	300 ... 1200 hPa
Unit	hPa	hPa
Accuracy	±0.5 hPa (0 ... 40 °C)	±0.5 hPa (0 ... 40 °C)
Wind direction		
Principle	Ultrasonic	Ultrasonic
Measuring range	0 ... 359.9 °	0 ... 359.9 °
Unit	°	°
Accuracy	< 3° RMSE > 1.0 m/s	< 3° RMSE > 1.0 m/s
Wind speed		
Principle	Ultrasonic	Ultrasonic
Measuring range	0 ... 75 m/s	0 ... 75 m/s
Unit	m/s	m/s
Accuracy	±0.3 m/s or 3 % (0 ...35 m/s) ±5 % (>35 m/s) RMS	±0.3 m/s or 3 % (0 ...35 m/s) ±5 % (>35 m/s) RMS
Resolution	0.1 m/s	0.1 m/s
Radiation		
Response time	< 18 s (95 %)	< 5 s (95 %)
Directional response	< 20 W/m² (at 80°)	< 10 W/m² (at 80°)
Temperature response	< 5 % (-10 ... +40 °C)	< 1 % (-10 ... +40 °C)
Spectral range (50% points)	300 ... 2,800 nm	285 ... 2,800 nm
Maximum operational irradiance	2,000 W/m²	4,000 W/m²
Non-stability (change/year)	< 1 %	< 0.5%
Non-linearity (100 to 1000 W/m²	< 1.5 %	< 0.2%
Zero offset A, thermal radiation (at 200 W/m²)	< 15 W/m²	< 7 W/m²
Zero offset B, temperature change (5 K/h)	< 5 W/m²	< 2 W/m²
Compass (WS501)		
Measurement range	0 ... 359°	-
Resolution	1.0°	-
Accuracy	±10°	-
Sampling rate	5 min	-

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