



Compact all-in-one weather sensor with measurement of temperature, relative humidity, air pressure, wind direction, wind speed and radiation.

- **Parameters measured**
Temperature, relative humidity, air pressure, wind direction, wind speed, radiation
- **Measurement technology**
Ultrasonic/Wind, NTC/T, Capacitive/RH, MEMS capacitive/Pressure, Kipp&Zonen Pyranometer/Radiation
- **Product highlights**
Wind detection with birdproof construction. Compact all-in-one weather sensor, low power, heater, aspirated radiation shield, maintenance-free operation, open communication protocol.
- **Interfaces**
RS485 with supported protocols UMB-Binary, UMB-ASCII, Modbus-RTU, Modbus-ASCII, XDR and SDI-12
- **Article number**
8375.1

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications. Integrated design with ventilated radiation protection for measuring: Air temperature, relative humidity, air pressure, wind direction, wind speed and radiation. One external temperature or rain sensor is connectable.

General

Dimensions	Ø approx. 150 mm, height approx. 332 mm
Weight	Approx. 1.5 kg
Interface	RS485, 2 - wire, half - duplex
Power supply	11...32 VDC
Power supply	5...11 VDC (electronics with limited precision of measurements)
Power supply	24 VDC +/- 10% (heater)
Power consumption	20 VA (heater)
Operating temperature	-50...60 °C (with heater)
Operating rel. humidity	0...100 % RH
Cable length	10 m
Protection level housing	IP66
Standards/Regulations	Compliant to IEC 61724-1:2017 Class C
Mast mounting suitable for	Mast diameter 60 - 76 mm

Temperature

Principle	NTC
Measuring range	-50 ... 60 °C
Unit	°C
Accuracy	±0.2 °C (-20...50 °C), otherwise ±0.5 °C (>-30 °C)

Relative humidity

Principle	Capacitive
Measuring range	0 ... 100 % RH
Unit	% RH
Accuracy	±2 % RH

Air pressure

Principle	MEMS capacitive
Measuring range	300 ... 1200 hPa
Unit	hPa
Accuracy	±0.5 hPa (0 ... 40 °C)

Wind direction

Principle	Ultrasonic
Measuring range	0 ... 359.9 °
Unit	°
Accuracy	< 3° RMSE > 1.0 m/s
Resolution	0.1

Wind speed

Principle	Ultrasonic
Measuring range	0 ... 75 m/s
Unit	m/s
Accuracy	±0.3 m/s or ±3 % (0 ... 35 m/s) ±5 % (>35 m/s) RMS
Resolution	0.1 m/s

Radiation	
Response time (95%)	< 18 s
Non-stability (change/year)	< 1 %
Non-linearity (0 to 1,000W/m ²)	< 1 %
Directional error (at 80° with 1,000W/m ²)	< 20 W/m ²
Temperature dependence of sensitivity	< 5 % (10... +40 °C)
Tilt error (at 1000W/m ²)	< 1 %
Spectral range	300...2800 nm
Measuring range	2000 W/m ²

Compass	
Measurement range	0 ... 359°
Resolution	1.0°
Accuracy	+/-10°
Sampling rate	5 minutes



First and only Smart Weather Sensor with integrated Kipp & Zonen CMP10 Pyranometer (secondary standard)

- **Parameters measured**
Temperature, relative humidity, air pressure, wind direction, wind speed, radiation
- **Measurement technology**
Ultrasonic/Wind, NTC/T, Capacitive/RH, MEMS capacitive/Pressure, Kipp&Zonen/Radiation
- **Product highlights**
Wind detection with birdproof construction. Compact all-in-one weather sensor, low power, heater, aspirated radiation shield, maintenance-free operation, open communication protocol.
- **Interfaces**
RS485 with supported protocols UMB-Binary, UMB-ASCII, Modbus-RTU, Modbus-ASCII, XDR and SDI-12
- **Article number**
8375.5

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications. Integrated design with ventilated radiation protection for measuring: Air temperature, relative humidity, air pressure, wind direction, wind speed and radiation. One external temperature or rain sensor is connectable.

General

Technical Data

WS510-UMB Smart Weather Sensor



Dimensions	Ø approx. 150 mm, height approx. 332 mm
Weight	Approx. 1.5 kg
Interface	RS485, 2 - wire, half - duplex
Power supply	11...32 VDC
Power supply	5 ... 11 VDC (electronics with limited precision of measurements)
Power supply	24 VDC +/- 10% (heater)
Power consumption	20 VA (heater)
Operating temperature	-50...60 °C (with heater)
Operating rel. humidity	0...100 % RH
Cable length	10 m
Protection level housing	IP66
Mast mounting suitable for	Mast diameter 60 - 76 mm

Temperature

Principle	NTC
Measuring range	-50 ... 60 °C
Unit	°C
Accuracy	±0.2 °C (-20...50 °C), otherwise ±0.5 °C (>-30 °C)

Relative humidity

Principle	Capacitive
Measuring range	0 ... 100 % RH
Unit	% RH
Accuracy	±2 % RH

Air pressure

Principle	MEMS capacitive
Measuring range	300 ... 1200 hPa
Unit	hPa
Accuracy	±0.5 hPa (0...40 °C)

Wind direction

Principle	Ultrasonic
Measuring range	0 ... 359.9 °
Unit	°
Accuracy	< 3° RMSE > 1.0 m/s
Resolution	0.1

Wind speed

Principle	Ultrasonic
Measuring range	0 ... 75 m/s
Unit	m/s
Accuracy	±0.3 m/s or ±3 % (0...35 m/s) ±5 % (>35 m/s) RMS
Resolution	0.1 m/s

Radiation

Technical Data

WS510-UMB Smart Weather Sensor



Response time	< 5 s
Zero offset A	< 7 W/m ²
Zero offset B	< 2 W/m ²
Directional error (at 1000 W/m ²)	< 0.2 %
Temperature dependence of sensitivity	< 1 % (-10 °C...40 °C)
Spectral range	285 to 2,800 nm
Measuring range	4000 W/m ²



Compact all-in-one weather sensor with measurement of temperature, relative humidity, precipitation intensity, precipitation type, precipitation quantity, air pressure, wind direction and wind speed.

- **Parameters measured**
Temperature, relative humidity, precipitation intensity, precipitation type, precipitation quantity, air pressure, wind direction, wind speed
- **Measurement technology**
Ultrasonic/Wind, NTC/T, Capacitive/RH, MEMS capacitive/Pressure, 24 GHz Doppler radar/Precipitation
- **Product highlights**
Wind detection with birdproof construction. Compact all-in-one weather sensor, low power, heater, aspirated radiation shield, maintenance-free operation, open communication protocol.
- **Interfaces**
RS485 with supported protocols UMB-Binary, UMB-ASCII, Modbus-RTU, Modbus-ASCII, XDR and SDI-12
- **Article number**
8370.2, 8370.1

From the WS product family of professional intelligent measurement transducers with digital interface for environmental applications. Integrated design with ventilated radiation protection for measuring: Air temperature, relative humidity, precipitation intensity, precipitation type, precipitation quantity, air pressure, wind direction and wind speed. One external temperature sensor is connectable.

General	
Dimensions	Ø approx. 150 mm, height approx. 343 mm
Weight	Approx. 1.5 kg
Interface	RS485, 2 - wire, half - duplex
Power supply	11 ... 32 VDC
Power supply	5 ... 11 VDC (electronics with limited precision of measurements)
Power supply	24 VDC +/- 10% (heater)
Power consumption	40 VA (heater)
Frequency range	24.150 GHz – 24.250 GHz (Europe; Article no. 8370.2) 24.075 GHz – 24.175 GHz (North America; Article no. 8370.1)
Operating temperature	-50...60 °C (with heater)
Operating rel. humidity	0...100 % RH
Cable length	10 m
Protection level housing	IP66
Standards/Regulations	Compliant to IEC 61724-1:2017
Mast mounting suitable for	Mast diameter 60 - 76 mm

Temperature	
Principle	NTC
Measuring range	-50 ... 60 °C
Unit	°C
Accuracy	±0.2 °C (-20...50 °C), otherwise ±0.5 °C (>-30 °C)

Relative humidity	
Principle	Capacitive
Measuring range	0 ... 100 % RH
Unit	% RH
Accuracy	±2 % RH

Air pressure	
Principle	MEMS capacitive
Measuring range	300 ... 1200 hPa
Unit	hPa
Accuracy	±0.5 hPa (0...40 °C)

Wind direction	
Principle	Ultrasonic
Measuring range	0 ... 359.9 °
Unit	°
Accuracy	< 3 ° RMSE > 1.0 m/s
Resolution	0.1

Wind speed	
Principle	Ultrasonic
Measuring range	0 ... 75 m/s
Unit	m/s

Technical Data

WS600-UMB Smart Weather Sensor



Accuracy	± 0.3 m/s or ± 3 % (0...35 m/s) ± 5 % (>35 m/s) RMS
Resolution	0.1 m/s

Precipitation (liquid)	
Droplet size	0,3 ... 5 mm
Detection sensitivity	0,01 mm/h
Particle velocity	0.9 ... 15.5 m/s
Precipitation types	rain/ snow
Solid precipitation	5.1 ... ~30 mm
Intensity range	0.5 ... 200mm/h
Intensity resolution	0.01 mm/h
Amount resolution	0.1 mm
Accuracy	20 % under laboratory conditions
Reproducibility	Typical >90 % under laboratory conditions