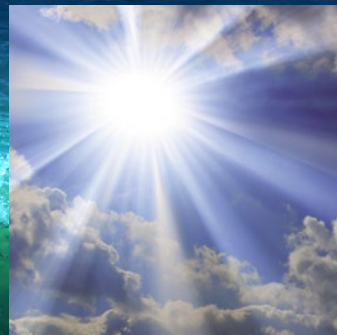


# Lufft WS Series of Compact Weather Sensors

Informed decision for all kinds of meteorological applications



*· a passion for precision · passion pour la précision · pasión por la precisión · passione per la precisione*



[www.lufft.com](http://www.lufft.com)

 **Lufft**

# Matrix Overview WS Series



Applications in Meteorology











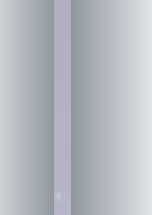
Air Quality/ Fine Dust Detection



AgMet

<b>Wind</b>	<b>Precipitation</b>	<b>Temperature</b> <b>Relative humidity</b> <b>Air pressure</b>	<b>Temperature</b> <b>Relative humidity</b> <b>Air pressure</b> <b>Precipitation</b>	<b>Temperature</b> <b>Relative humidity</b> <b>Air pressure</b> <b>Radiation</b>
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## Lufft WS Sensors: The Reference

								
<b>Ventus</b>	<b>WS100</b>	<b>WS3000</b>				<b>WS3100</b>		

## Lufft WS Sensors: WMO-Standard

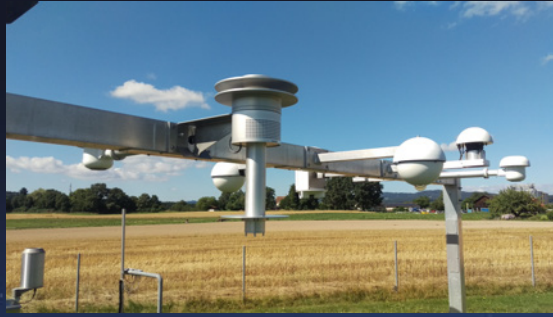
								
<b>WS200</b>		<b>WS300</b>		<b>WS400</b>		<b>WS310</b>	<b>WS301/303</b>	

## Lufft WS Sensors: Meteo-Smart

								
<b>V200A</b>			<b>WS401</b>		<b>WS302</b>	<b>WS304</b>		



Hydrology



Reference Networks



Renewable Energies and more...

Temperature  
Relative humidity  
Wind speed and direction

Temperature  
Relative humidity  
Air pressure  
Wind speed  
Wind direction  
Radiation

Temperature  
Relative humidity  
Wind speed  
Wind direction  
Precipitation

Temperature  
Relative humidity  
Wind speed  
Wind direction  
Precipitation  
Radiation



WS510



WS800



WS500



WS501



WS503



WS600



WS700



WS502



WS504



WS601

# Technical data

## Wind speed

- Measuring method: ultrasonic, 10 Hz
- Measuring range: 0 ... 75 m/s (WS601: 0 ... 30 m/s)
- Resolution: 0.1 m/s
- Accuracy:  $\pm 0.3$  m/s or  $\pm 3$  % (0 ... 35 m/s),  $\pm 5$  % (35 ... 75 m/s) RMS
- Response threshold: 0.3 m/s
- Units: m/s, km/h, mph, kts

## Wind direction

- Measuring method: 4x 10 Hz ultrasonic sensors
- Measuring range: 0 ... 359,9°
- Resolution: 0.1°
- Accuracy:  $\pm 3^\circ$  (> 1m/s) RMSE
- Threshold: 0.3 m/s

## Compass

- Measuring method: built-in electronic compass
- Measuring range: 0 ... 359°
- Resolution: 1°
- Accuracy:  $\pm 10^\circ$
- Measuring rate: 5 minutes

## Electrical data

### Interfaces\*

- SDI-12, release 1.3 (factory setting)
- RS-485, galvanically isolated, half-duplex, baud rates 1200 ... 19200
- RS-485 protocols: Binary, ASCII, TLS2002FG3, MODBUS

\*May be selected using the Lufft-Config tool (PC software for Windows OS)

### Power supply

- Input voltage: 4 ... 32 VDC
- Power consumption, standard mode: 85 mA max. @ 12 VDC (fan)
- Power consumption, mode no. 1: 25 mA @ 12 VDC (WS200, WS500/501, WS600/601) 8 mA @ 12 VDC (WS300/301, WS400)
- Power consumption, mode no. 2: 2 mA @ 12 VDC
- Heater: 24 VDC/20 W 24 VDC/40 W (WS400/600)

## Air temperature

- Measuring method: NTC
- Measuring range: -50 ... +60 °C
- Resolution: 0.1 °C (-20 ... +50 °C), otherwise 0.2 °C
- Accuracy:  $\pm 0.2$  °C (-20 ... +50 °C), otherwise  $\pm 0.5$  °C

## Dew point temperature

- Measuring method: passive, calculated from air temperature and air humidity
- Measuring range: -50 ... +60 °C
- Resolution: 0.1 °C
- Accuracy:  $\pm 0.7$  °C

## Air humidity

- Measuring method: capacitive
- Measuring range: 0 ... 100 % R.H.
- Resolution: 0.1 % R.H.
- Accuracy:  $\pm 2$  % R.H.

## Barometric pressure

- Measuring method: MEMS sensor, capacitive
- Measuring range: 300 ... 1200 hPa
- Resolution: 0.1 hPa
- Accuracy:  $\pm 0.5$  hPa (0 ... +40 °C)

## Ambient

### Operating temperature range

-50 ... +60 °C

### Storage temperature

-50 ... +70 °C

### Relative humidity

0 ... 100 % R.H.

## General data

### Dimensions (H x Ø)

194 to 445 mm (model) x 150 mm

### Weight

0.8 to 1.7 kg (model)

### Fastener

Ø 2" or 60 ... 76 mm

### Material

Plastic (PC) and  
Stainless steel mounting clamp

### Colour

White

### Type of protection

IP66

## Global radiation

- Measuring method: CMP3 thermopile pyranometer, Class 2
- Spectral range: 300 ... 2800 nm
- Measuring range: 0 ... 1400 W/m<sup>2</sup>
- Resolution: 1 W/m<sup>2</sup>
- Temp. error:  $\pm 5$  % (-10 ... +40 °C)

## Precipitation (liquid)

- Measuring method: tipping bucket
- Type: rain
- Bucket orifice: 200 cm<sup>2</sup>
- Measuring range: 0 ... 200 mm/h
- Resolution: 0.2 mm
- Accuracy:  $\pm 2$  %

## Precipitation (liquid/solid)

- Measuring method: Doppler radar
- Types: rain, snow
- Measur. range drop size: 0.3 ... 5 mm
- Intensity: 0 ... 200 mm/h
- Resolution (liquid): 0.01 mm
- Repeatability: > 90 %
- Accuracy:  $\pm 20$  % (related to the annual precipitation and depending on weather and site specific conditions)

## Standards

- EMC directive: 2004/108/EC
- Emitted interference: EN 55011:2009, EN 61000-6-3
- Immunity: EN 61000-6-2 and EN 61000-4-2/3/4/5/6/8/16/29
- RoHS directive: 2011/65/EU
- IEC / CISPR 11
- prEN 50147-3



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