



Wind sensor static WSS REC DATA SHEET



Static sensor

- No moving parts
- High-precision ultrasonic measurements

High resolution

- Wind direction 1°
- Wind speed 0.1m/s

Robust design

- Seawater-proof housing
- Vibration tested up to 2.3g

Watertight

- According to IP66

Extreme temperatures

- Operates down to -52 °C
- Operates to +60 °C

Heating element

- WSS REC has a built-in, automatically activated heating element to prevent ice

Wide power supply range

- Nominal 12V DC or 24V DC supply voltage

Interface

- RS485 I/O using NMEA 0183 data protocol for direct connection to control system



Data sheet

Technology

DEIF Static Wind Sensor Technology uses ultrasound to determine horizontal wind speed and direction. The WSS REC sensor has no moving parts so it is free from the challenges posed by conventional mechanical wind sensors (friction, inertia, time constant, over-speeding, starting threshold). The unique triangular design of the sensor array assures accurate measurement of wind from all directions. To prevent ice when used in cold climates, the WSS REC sensor is automatically heated by means of a built-in heating element. Finally, the WSS REC sensor is maintenance-free and does not require field calibration.

Applications

WSS REC is classified for residential, commercial and light industry plus industrial environment. The WSS REC sensor can be used under almost any conditions.

Housing

The WSS REC is designed to withstand the hostile environment on top of a nacelle or measurement mast. The 1" stainless steel mounting rod with standard $\frac{3}{4}$ " pipe thread facilitates mounting and makes it easy to make a good earth connection through the mast or tower or an earth cable.

Interface

The WSS REC has an RS485 two-way interface with communication following the NMEA 0183 protocol.

Supply

The WSS REC can be supplied from a DC supply of nominal 12...24V DC.

Cable

The WSS REC is connected with a single 4 x 0.75mm² screened cable. Cable extension can be made by a standard 4 x 0.75mm² screened cable, e.g. UL2464 18AWG4C+AE, length max. 300 metres. The capacity between signal conductors should not exceed 70nF. Twisted pair is recommended.



Wind Sensor Static WSS REC

Error flag

The WSS REC continuously evaluates the measurements, and if obstructions or incorrect measurements are detected, an invalid flag is set in the NMEA 0183 message to indicate that data is invalid and should not be used. This could be caused by a bird landing on the sensor. As soon as the disturbance disappears, the flag will be cleared and valid measurements sent.

Customised setup

Forming part of a normal wind system, the WSS REC will not need any setup. If the sensor is used for special applications, there might be special needs, for example storing data for automatic sensor alignment corrections. Such special needs can often be accomplished by sending control commands to the sensor via the RS485 interface, so please contact DEIF if you have special needs like this.

Options

- Bird avoidance kit; a needle cap to prevent birds from landing on the sensor, thus disturbing the measurements or damaging the ultrasound elements.
- WSS REC shielded extension cable, variable length from 1 to 300 metres.
- IP67 connector kit, for use with extension cable (for soldering).
- IP66 connection box kit, for use with extension cable.

Technical specifications

The sensor is designed according to the standards below		Standards
Power supply	12V or 24V DC (9.0...31.2V DC)	
Power consumption	With inactive heating element: <0.1W With automatic heating at maximum: <15W	
Interface	RS485 bus: The bus should be terminated with 120 to 200 ohm for pure RS485 operation RS422 bus: For single listener connection on RS422, the data line must be terminated with a 200 to 250 ohm resistor to obtain the necessary output Hardware settings: These are the RS485 hardware settings: Baud rate: 4800 bps Data: 8 data bits Parity: None parity Stop: 1 stop bit Flow control: No flow control	
Data sentence	NMEA 0183: \$WIMWV – Wind speed and direction data \$WIXDR – Transducer measurement response \$WITXT – Error messaging For details, see the Appendix to User's Manual, WSS REC, document no. 4189350038.	NMEA 0183 ver. 3.0
Wind speed	Range: 0...60m/s Resolution: 0.1m/s Accuracy: 0...35m/s: ±0.3m/s or ±3%, whichever is greater >36m/s: ±5%	
Wind direction	Range: 0... 360° continuously Resolution: 1° Accuracy: ±3% in relation to wind direction	
Update interval	1 sec.	
Start-up time	<5 sec. from power on to valid data output	
Connection	10 metres 4 x 0.75mm ² screened cable type UL2464 18AWG/4C+DW+AL/MY+Jacket The 10m cable is fixed on the sensor and is open-ended	
Mounting	¾" pipe thread: Outer diameter: 1.04 inches (26.4mm), 14 threads per inch	
Compass safety distance	0.2 metres (8 inches)	IEC 945 and EN 60945
Protection	IP66	IEC 529 and EN 60529
Relative humidity	0... 100%	EN/IEC 60068-1/2
Pressure	600...1100hPa	
Temperature	Operating range: -52...+60 °C (class approved for: -25...+60 °C) Storage: -60...+70 °C	EN 60051
Vibration test	3...13.2Hz: 2mm (peak-peak) 13.2...100Hz: 0.7g	EN 60945, EN/IEC60068-2-6 and DNV Class A
	3...15Hz: ±2.5mm (peak) 15...50Hz: 2.3g	GL curve 4 for masts
Safety	Cat. III, poll. dg. 2, 550V AC rms, 50Hz, 1 minute	EN 61010-1
EMC	CE-marked for industrial environment	EN 61000-1-1/2/3/4
Housing	Wind sensor housing: Polycarbonate +10% glass fibre Mounting tap: Corrosion-resistant stainless steel	UL94 V0
Weight	0.8kg	
Dimensions, cardboard box	450 x 315 x 230mm	

The sensor is designed according to the standards below		Standards
Accessories	<p><u>IP66 connection box kit</u>: IP66 connection box with cable glands and screw terminals to extend the sensor cable with an extension cable.</p> <p><u>IP67 connector kit</u>: Watertight male and female connector for soldering to the sensor cable and the extension cable respectively.</p> <p><u>Extension cable</u>: 1 to 300 metres 4 x 0.75mm² shielded cable (1m steps) DEIF ID no.1020230016.</p> <p><u>Bird avoidance kit</u>: Spike kit to prevent birds from interrupting the wind measurements or, in worst case, from damaging the sensor.</p>	

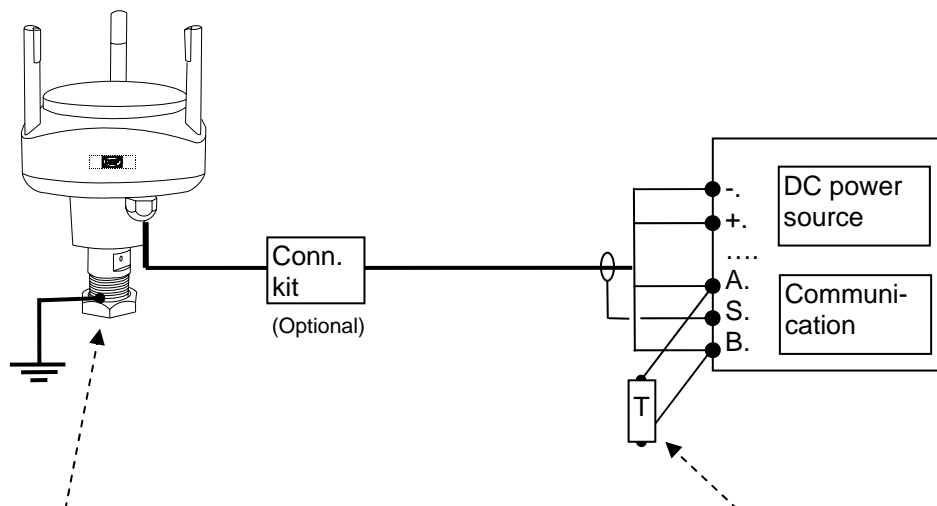
Labels

Product label:

WSS REC		CE logo
SN:		Disposal icon
DEIF logo	Bar code + item number	

Terminals and function – cable colours and function

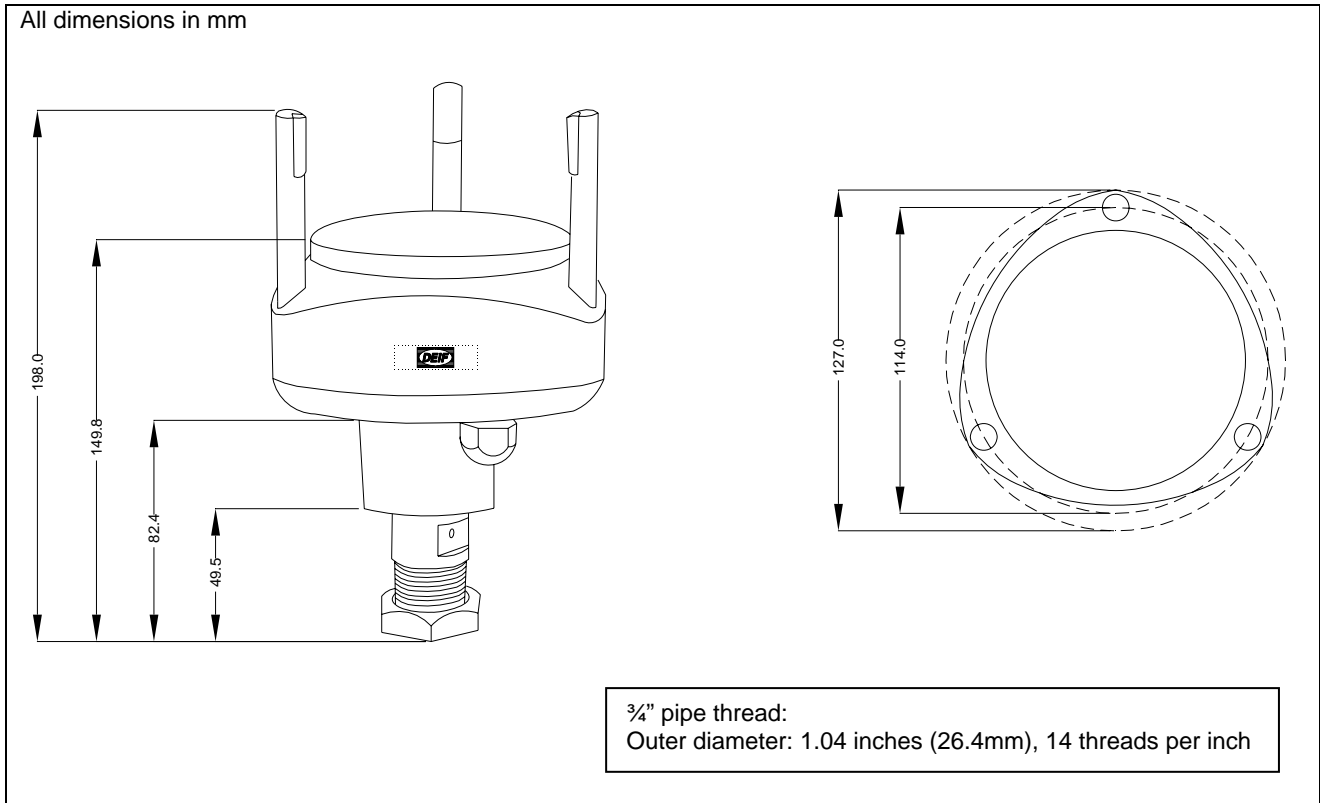
Cable colour	Function	Note
Black	Supply voltage -	DC supply voltage for the wind sensor
Red	Supply voltage +	
Orange	RS485 comm. A	Wind speed and direction data output
Brown	RS485 comm. B	
Shield	Electrical shielding of data signal	See the warning below



IMPORTANT!
The stainless steel mounting base of the WSS must be connected to a good ground connection!

IMPORTANT!
The data bus must be terminated with a resistor (see the technical specifications above) to secure stable operation!

Unit dimensions, WSS REC



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Due to our continuous development we reserve the right to supply equipment which may vary from the described.

