



-power in control



DATA SHEET



Wind sensor type WSS and WSS-L

- Static sensor
- High resolution
- Approvals
- Robust design
- Watertight
- Extreme temperatures
- Heating element
- Wide power supply range
- Interface



DEIF A/S · Frisenborgvej 33 · DK-7800 Skive
Tel.: +45 9614 9614 · Fax: +45 9614 9615
info@deif.com · www.deif.com

Document no.: 4921250059F

Data sheet

Technology

DEIF Static Wind Sensor Technology uses ultrasound to determine horizontal wind speed and direction. The WSS and WSS-L sensors have no moving parts so they are 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. The WSS sensor is automatically heated when used in cold climates. Finally, WSS/WSS-L sensors are maintenance-free and do not require field calibration.

Versions

The wind sensor is available in two versions:

- WSS with built-in heating element to prevent ice
- WSS-L without heating

Applications

WSS/WSS-L are classified for residential, commercial and light industry plus industrial environment.

The WSS sensor can be used in almost any conditions, where the WSS-L is only specified down to 0°C, but it will work far below that temperature as long as ice or snow is not covering the sensor elements or obstructing the sight between the elements. The WSS-L should only be used in relatively warm geographic areas or in applications where wind data is mainly for information and not critical for operation or safety.

- The WSS or WSS-L can be directly connected to the DEIF WSDI-2 display forming a superb wind system.
- Alternatively, it can be used with the former display – WSDI – which required a WSI interface box.
- It forms part of the WSS upgrade kit used to replace the old DEIF 879 dynamic wind sensor.
- Finally, WSS or WSS-L can be used as precise stand-alone wind sensors in a system (e.g. a DP system).

Housing

The WSS is designed to withstand the hostile environment onboard a ship.

The 1" stainless steel mounting rod with standard 3/4" pipe thread makes the mounting easy and secures good earth connection through the hull of the ship.

Interface

The WSS/WSS-L has a RS485 two-way interface with communication following the NMEA 0183 protocol.

Supply

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

Cable

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

Wind sensor static WSS/WSS-L



Error flag

The WSS/WSS-L continuously evaluates the measurements, and if obstructions or incorrect measurements are detected, an error flag is set in the NMEA0183 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 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.

Protection from birds

Birds are known to be able to damage ultrasonic wind sensors; therefore the bird avoidance kit is made standard on all DEIF WSS and WSS-L sensors. This needle cap prevents birds from landing on the sensor.

Option

- A VDR (voyage data recorder) can be connected directly to the RS485 port.
- Bird avoidance option is available for previously delivered sensors without "bird kit" pre-installed.
- WSS-shielded extension cable, variable length from 1 to 300 meters.
- IP67 connector kit, for use with extension cable (for soldering).
- IP66 connection box kit, for use with extension cable

Technical specifications

Sensors are designed according to the standards below		Standards
Power supply	12 V or 24V DC (9.0...31.2V DC)	
Power consumption	WSS-L and WSS with inactive heating element: < 0.1 W WSS with maximum heating \leq 15 W	
Interface	RS485 bus (I/O). The bus should be terminated with 120 to 200 ohm for pure RS485 operation. Combined RS485 (I/O) and NMEA0183 (I) operation: A combination of up to ten RS485 (I/O) and one NMEA0183 listeners can be connected to the WSS data interface at the same time. The data line must be terminated with a 200 to 250 ohm resistor to obtain $\geq \pm 2.1$ V output necessary for a standard NMEA0183 input circuit to work. The NMEA0183 input load must be ≤ 2 mA @ ± 2 V. NOTE: A NMEA-buffer is recommended if connection of more than one standard NMEA-input is needed.	NMEA 0183 ver. 2.x-3.0
Data sentence	NMEA0183: \$WIMWV – Wind speed and direction data \$WIXDR – Transducer Measurement Response \$WITXT – Error messaging For details, see the Appendix to User's Manual, Wind measuring system, document no. 4189350028.	NMEA 0183 ver. 3.0
Wind speed	Range: 0...116 KTS (0...60 m/s) Resolution: 0.1 Knots Accuracy: 0...68 KTS: ± 0.6 KTS or $\pm 3\%$, whichever is greater > 68 KTS: $\pm 5\%$	
Wind direction	Range: 0... 360° continuously Resolution: 1° Accuracy: $\pm 3\%$ in relation to wind direction	
Update interval	1 second	
Start-up time	< 5 sec. from power on to valid data output	
Connection	2 meter 4 x 0.75 mm ² screened cable type UL2464 18AWG/4C+DW+AL/MY+Jacket. The 2 m cable is fixed mounted on the sensor and is open-ended.	
Mounting	3/4" pipe thread: Outer diam: 1.04 inch (26.4 mm), 14 threads per inch.	
Compass safety distance	0.2 meter (8 inch)	IEC 945 and EN 60945
Protection	IP66	IEC 529 and EN 60529
Relative humidity	0... 100%	EN/IEC 60068-1/2
Pressure	600...1100 Pa	
Temperature	WSS operating range: -52...+60°C (class approved for: -25...+60°C) WSS-L operating range: 0...60°C (see note) Storage (both): -60...+70°C Note: WSS-L has no automatic heating element to prevent ice, the sensor will work below 0°C, but it will depend on weather conditions.	EN 60051
Vibration test	3...13.2 Hz: 2 mm (peak-peak) 13.2...100 Hz: 0.7 g	EN 60945, EN/IEC60068-2-6 and DNV Class A
	3...15 Hz: ± 2.5 mm (peak) 15...50 Hz: 2.3 g	GL curve 4 for masts
Safety	Cat.III, poll.dg.2, 550V AC rms, 50 Hz, 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	0.8 kg	
Dimensions, cardboard box	450 x 315 x 230	
Approvals	Type-approved according to:	CCS, DNV, GL, GOST-R, RRR, and RS

Accessories	<p><u>IP66 Connection box kit</u>: IP66 Connection box w/cable glands and screw terminals to extend the sensor cable with an extension cable.</p> <p><u>IP67 Connector kit</u>: water tight male and female connector for soldering to respectively the sensor cable and the extension cable.</p> <p><u>Extension cable</u>: Available in 30, 40, 50, 100 metre's length 4x0.75 mm² shielded cable</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. (For retrofit on previous WSS/WSS-L versions only).</p>	
-------------	---	--

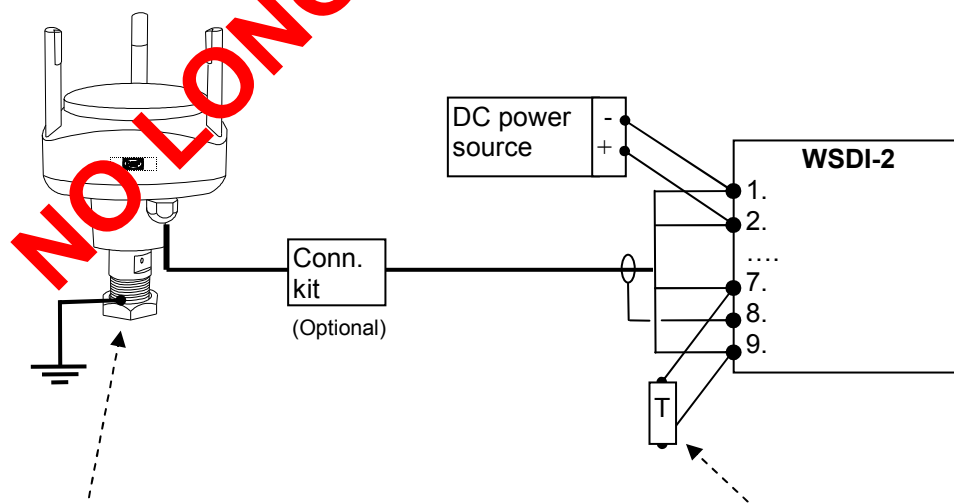
Labels

Product label:

WSS	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	+	
Orange	RS485 comm. A	Wind speed and direction data output
Brown	B	
Shield	Electrical shielding of data signal	The shield shall normally not be connected to terminal 8, only if electrical noise is interfering with the operation of the WSDI-2. See also the warning below.



IMPORTANT!

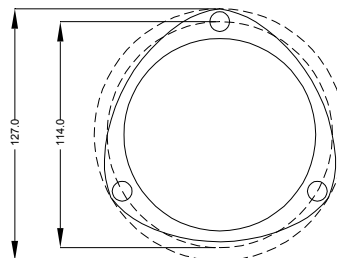
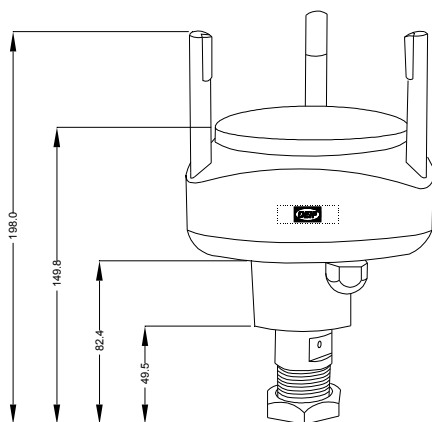
The stainless steel mounting base on the WSS/WSS-L must be connected to the ship's metal hull or another good ground connection!

IMPORTANT!

The data bus must be terminated with a resistor (see technical spec. above) to secure stable operation!

Unit dimensions, WSS and WSS-L

All dimensions are in mm



$\frac{3}{4}$ " pipe thread:
Outer diam: 1.04 inch (26.4 mm) 14 threads per inch.

NO LONGER FOR SALE

Available variants

Type	Variant no.	Description	Item no.	Note
WSS	01	WSS with bird avoidance and heating	2958050060-01	
WSS-L	02	WSS-L with bird avoidance (no heating)	2958050060-02	
WSS upgrade kit	01	WSS with bird avoidance and WSI interface box	2958040050-01	
WSS-L upgrade kit	01	WSS-L with bird avoidance and WSI interface box	2958040150-01	

Available accessories

Accessory	Description	Type	Note
WSS extension cable 1	30 m, 4 x 0.75 mm ² , shielded	Cable	
WSS extension cable 2	40 m, 4 x 0.75 mm ² , shielded	Cable	
WSS extension cable 3	50 m, 4 x 0.75 mm ² , shielded	Cable	
WSS extension cable 4	100 m, 4 x 0.75 mm ² , shielded	Cable	
WSS IP66 connection box kit	Connection box kit for WSS cable extension	Connection box	Alternative to IP67 connectors
WSS IP67 connector kit	2 connectors for WSS extension cable (IP67, solder)	Connector	Alternative to IP66 connection box

NO LONGER FOR SALE

Order specifications

Product Variants:

Mandatory Information			Additional accessories to a Standard Variant	
Item no.	Type	Variant no.	Accessory	Accessory

Example:

Mandatory Information			Additional accessories to a Standard Variant	
Item no.	Type	Variant no.	Accessory	Accessory
2958050060-01	WSS	01	WSS extension cable 2	WSS IP66 connection box kit

NO LONGER FOR SALE



DEIF A/S, Frisenborgvej 33
DK-7800 Skive, Denmark

Tel.: +45 9614 9614, Fax: +45 9614 9615
E-mail: deif@deif.com, URL: www.deif.com



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

