WSS 750

High performance wind sensors

Data sheet

DEIF Improve Tomorrow

1. Technology

DEIF Static Wind Sensor Technology uses ultrasound to determine horizontal wind speed and direction.

The WSS 750 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.

The WSS 750 sensor is automatically heated when used in cold climates.

Finally, the WSS 750 is maintenance-free and does not require field calibration.

1.1 Applications

WSS 750 is the top of the line, ruggedised and very high performance wind sensor for demanding applications in all weather conditions.

When wind data is essential for the operation and manoeuvring of the ship, the WSS 750 sensor is the right choice. DP vessels and large ferries are good examples of such applications.

The serial data output provides high accuracy relative wind data in the NMEA0183 MWV data sentence format, which makes it compatible with most systems.

The WSS 750 can be directly connected to the DEIF WSDI-2 display forming a superb wind measuring system.

Existing WSS based wind measuring systems can be upgraded, by simply replacing the old sensor with the WSS 750 – the data protocol is compatible and existing mast cable can be used.

WSS 750 can also be used to replace the old DEIF 879 dynamic wind sensor, but in this case the WSI interface box is required in addition.

1.2 Housing

The WSS 750 is designed to withstand the hostile environment on-board a ship.

The stainless steel house and robust universal mounting bracket makes it easy to mount.

1.3 Interface

The WSS 750 has an RS485 electrical interface with communication following the NMEA 0183 protocol.

One opto-insulated NMEA port can be connected directly to the RS485 port. e.g. for connection to a VDR (voyage data recorder).

1.4 Cable

The WSS 750 sensor is supplied with a 2 meter shielded cable. Cable extension can be made by a standard 4 x 0.75 mm^2 shielded cable e.g. UL2464 18AWG4C+AE.

Twisted pair is recommended.

Max. recommended cable length is 300 meters; please consider the voltage drop in the cable.

When a standard extension cable longer than 50 meters is used for a WSS 750 (heated) sensor, it is recommended to increase the supply voltage to 30 V DC or instead use a 4 x 1.5 mm^2 (or heavier) shielded cable or at least a 2 x 1.5 mm^2 shielded cable for the power supply.

2. Technical specifications

Sensors are designed according to the standards below		Standards
Power supply	Operation: 24 to 32 V DC (min. 18 V and max. 40 V DC	
Power consumption	No or inactive heating: < 2 W Maximum heating < 40 W Recommended power supply: 24 V DC, 2 A continuously.	
Interface	RS485 bus (I/O) at 4800 bit/s. 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 750 data interface at the same time. The data line must be terminated with a 200 to 250 ohm resistor to obtain ≤ +/- 2.1 V output necessary for a standard NMEA0183 input circuit to work. The NMEA0183 input load must be = or < 2 mA @ +/- 2V. NOTE: An NMEA-buffer is recommended if connection of more than one standard NMEA-input is needed.	NMEA 0183 ver. 2.x or higher. IEC/EN 61162-1
Data sentence	NMEA0183: $WIMWV - Wind speed and direction data	NMEA 0183 ver.2.0 or higher. IEC/EN 61162-1
Wind speed	Range: 0...125 KTS (0...65 m/s) Resolution: 0.01 m/s (0.02 knots) Accuracy: +/- 0.2 m/s (+/-0.4 KTS) or 3 %, whichever is greater	
Wind direction	Range: 0...360° continuously Resolution: 1° Accuracy: +/- 2°	
Update interval	1 second	
Start-up time	< 5 sec. from power on to valid data output	
Connection	IP67 connector in the sensor. Included: 2 m cable with preinstalled IP67 connector to be connected to the wind sensor and with open ends for screw terminal connection to an extension cable, e.g. using the connection box accessory kit.	
Mounting	Mounting bracket included for mounting on vertical mast or horizontal beam.	
Compass safety distance	0.5 meter (20 inches)	IEC/EN 60945
Protection	IP66 and IP67	IEC/EN 60529
Relative humidity	0...97 %	IEC/EN 60068-1/2
Temperature	Operating range: WSS 750 heated: -40° to +60°C Storage: -60° to +80°C	IEC/EN 60051

| Sensors are designed according to the standards below		Standards
Vibration test	3...13.2 Hz: 2 mm (peak-peak) 13.2...100 Hz: 0.7 g	IEC/EN 60945, IEC/EN 60068-2-6
	3...13.2 Hz: 6.0 mm (peak-peak) 13.2...50 Hz: 2.1 g	DNV Class C (Mast)
Shock	30 g, 11 ms, half sine, in all 3 axes.	IEC/EN 60068-2-27
EMC	CE-marked for marine and industrial environment	IEC/EN 60945, IEC/EN 61000-2-2/4
Housing	Stainless steel	
Weight	Sensor w/cable and mounting bracket: 2.5 kg Total shipping weight: 3 kg	
Dimensions, cardboard box	420 x 300 x 300 mm	
Approvals	DNV-GL, RS, RRR and CSS approved. Refer to www.deif.com for the most recent approvals.	
Accessories	IP66 connection box kit: IP66 connection box for mounting in the mast, with two M20 cable glands for 5-13 mm cable and srew terminal block inside. This box is used to connect the wind sensor cable to an extension cable. Extension cable: 4 x 0.75 mm^2 shielded black cable, available in standard length: 30, 40, 50 or 100 meters.	

3. Dimensions and terminal connections

3.1 Unit dimensions

All dimensions in mm
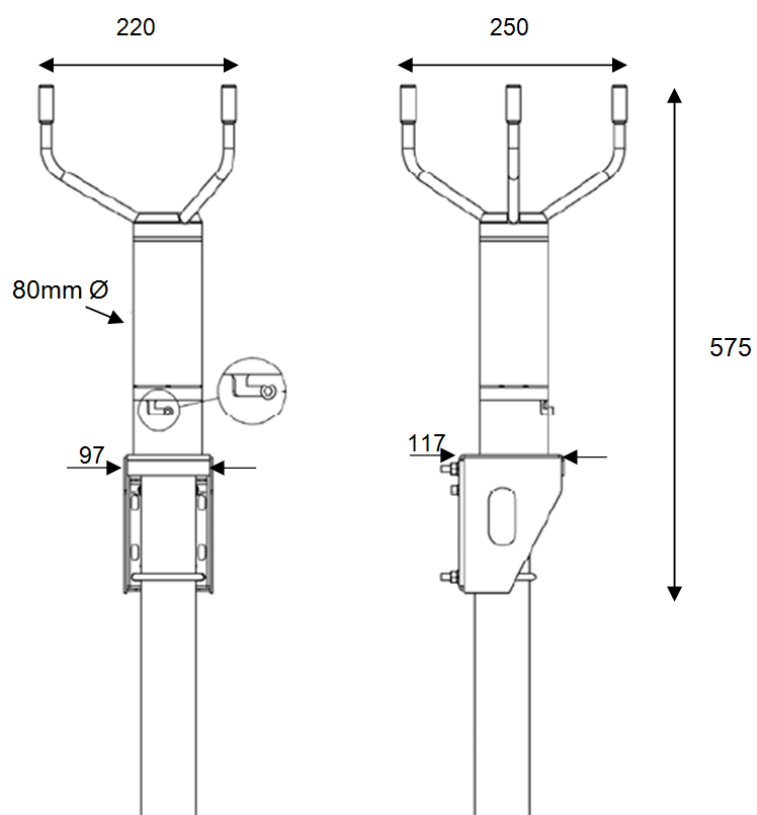
Mounting bracket dimensions:
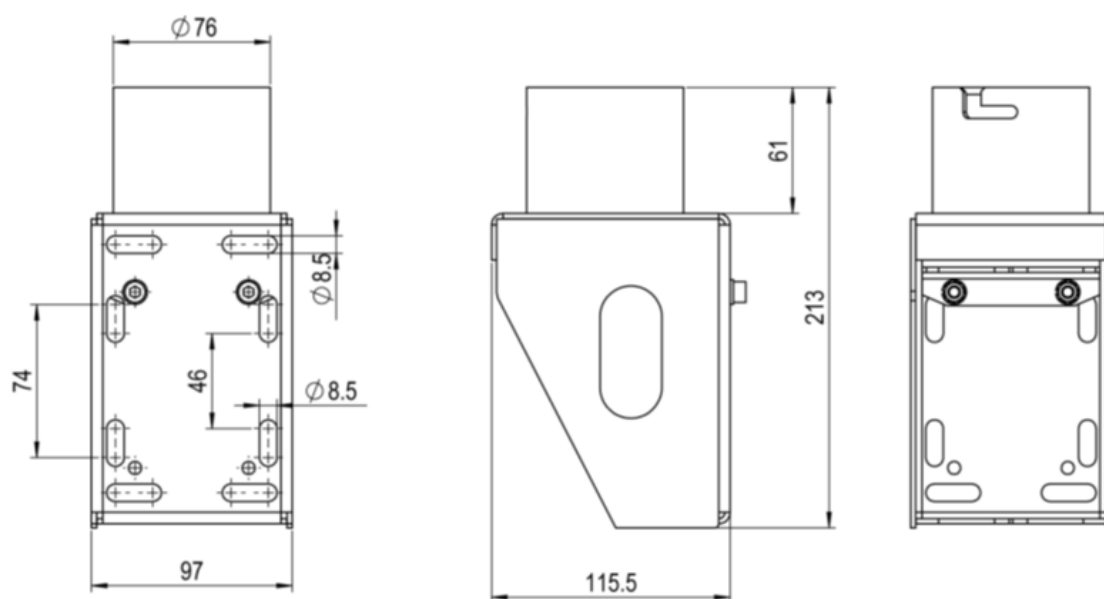
3.2 Terminals, cable colours and function

Function	Pin	WSS-7 cable #228260 wire colour	WSS extension cable Wire colours	XDi-N Display terminal no.
+24 V DC operation	1	White	Red	5
+24 V DC heating	5 6	Grey, green, pink		
0 V operation	11	Grey/pink	Black	4
0 V heating	7 8	Blue, black, red, yellow		
RS485 RX/TX A (COM2)	14	Red/blue	Orange	10 on NX2 module
RS485 RX/TX B (COM2)	3	Brown	Brown	11 on NX2 module
COM ground	10	Violet	Not connected	Not connected
Cable shield	Shield	Shield	Shield	Ground
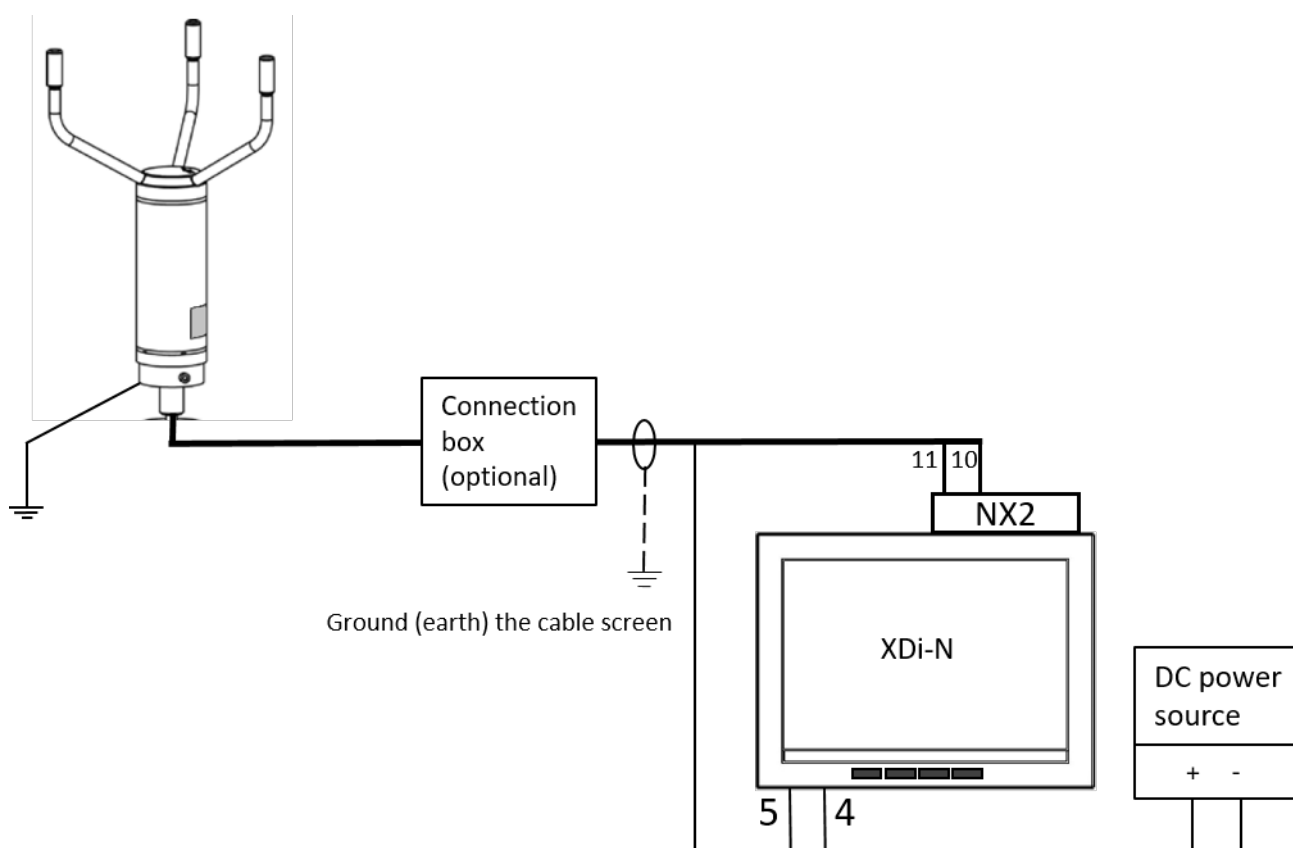
NOTE The stainless steel mounting base on the WSS 750 <u>must</u> be connected to the ship's metal hull or another good ground connection.

NOTE The data bus must be terminated with a resistor to secure stable operation.

4. Variants and accessories

4.1 Available variants

Type	Variant no.	Description	Item no.	Note
WSS 750	07	Static wind sensor with heating	2958050060-07	Electrical compatible with WSS/WSS-L

4.2 Available accessories

Description	Note
Extension cable for WSS, 30 meters	
Extension cable for WSS, 40 meters	
Extension cable for WSS, 50 meters	
Extension cable for WSS, 100 meters	
IP66 connection box kit	IP 66 box, 2 x M20 cable glands for 5-13 mm cable and 5 position screw terminal block.
IP67 connection box kit with cable mounted	

5. Ordering form and disclaimer

5.1 Order specifications

Send your order specification to DEIF listing:

- Item number
- Description
- Amount
- List of accessories

Table 5.1   Add table title here

Item no.	Description	Amount	Accessories
2958050060-07	Static wind sensor with heating	2	1 x Extension cable for WSS, 40 meters 1 x Extension cable for WSS, 50 meters

5.2 Disclaimer

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