



-power in control



DATA SHEET



WSS 700 and WSS 750 **High performance wind sensors**

- High resolution
- Marine-approved
- Stainless steel housing
- Operates in extreme conditions
- Standard NMEA protocol



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

Document no.: 4921250070A
SW version:

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1. Wind Sensor Static 700 and 750

1.1 Technology

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

The WSS 700 and 750 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 750 sensor is automatically heated when used in cold climates.

Finally, the WSS 700 series is maintenance-free and do not require field calibration.

1.2 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 700 series 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 new WSS 700 or WSS 750 – the data protocol is compatible and existing mast cable can be used. WSS 700 or 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.

1.3 Housing

The WSS 700 series 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.

1.4 Interface

The WSS 700 series 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).

1.5 Supply

The WSS 700 series requires a 24 V DC supply.



1.6 Cable

The WSS 700 or WSS 750 sensor is supplied with a 2 meter shielded cable. Cable extension can be made by a standard 4 x 0.75 mm² 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 mm² (or heavier) shielded cable or at least a 2 x 1.5 mm² shielded cable for the power supply.

1.7 Options and accessories

- WSS-shielded extension cable (30, 40, 50 or 100 meters)
- IP66 connection box kit, for use with extension cable.

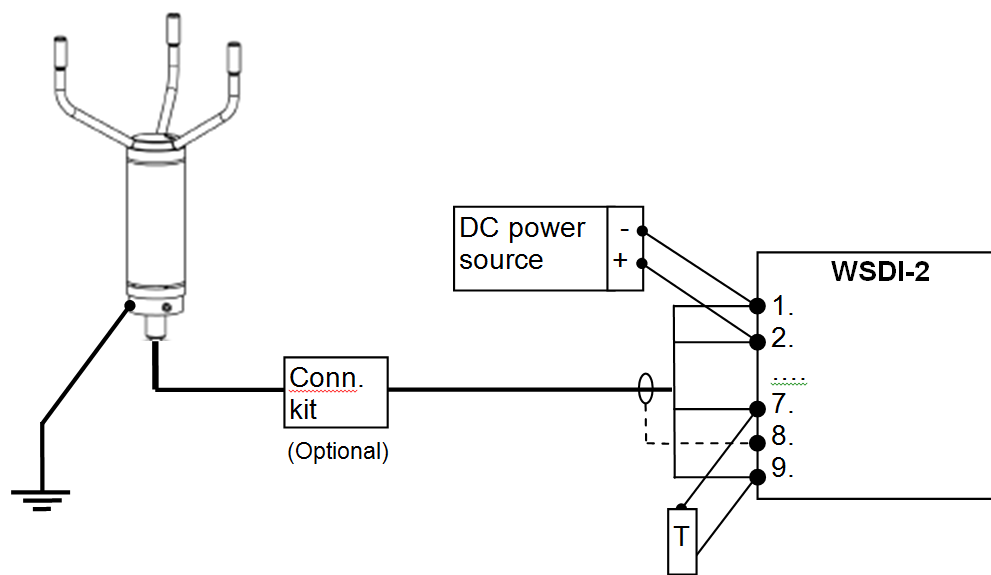
1.8 Technical specifications

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. <u>Combined RS485 (I/O) and NMEA0183 (I) operation:</u> A combination of up to ten RS485 (I/O) and one NMEA0183 listeners can be connected to the WSS 700 series data interface at the same time. The data line must be terminated with a 200 to 250 ohm resistor to obtain $\leq \pm 2.1$ V output necessary for a standard NMEA0183 input circuit to work. The NMEA0183 input load must be ≤ 2 mA @ ± 2 V. NOTE: 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: $\pm 2^\circ$	
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

Sensors are designed according to the standards below		Standards
Temperature	Operating range: WSS 700 unheated: -10° to +60°C WSS 750 heated: -40° to +60°C Storage: -60° to +80°C	IEC/EN 60051
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	Type-approved according to: DNV and more, please see www.de-if.com for updated list of approvals.	
Accessories	<u>IP66 connection box kit:</u> IP66 connection box for mounting in the mast, with two M20 cable glands for 5-13 mm cable and screw terminal block inside. This box is used to connect the wind sensor cable to an extension cable. <u>Extension cable:</u> 4 x 0.75 mm ² shielded black cable, available in standard length: 30, 40, 50 or 100 meters.	

1.9 Terminals, cable colours and function

Function	Pin	WSS-7 cable #228260 wire colour	WSS extension cable Wire colours	WSDI-2 Display terminal no.
+24 V DC operation	1	White	Red	2
+24 V DC heating	5 6	Grey, green, pink		
0 V operation	11	Grey/pink	Black	1
0 V heating	7 8	Blue, black, red, yellow		
RS485 RX/TX A (COM2)	14	Red/blue	Orange	7
RS485 RX/TX B (COM2)	3	Brown	Brown	9
COM ground	10	Violet	Not connected	Not connected
Cable shield	shield	shield	shield	Not connected (8)



! IMPORTANT! The stainless steel mounting base on the WSS 750 must be connected to the ship's metal hull or another good ground connection!

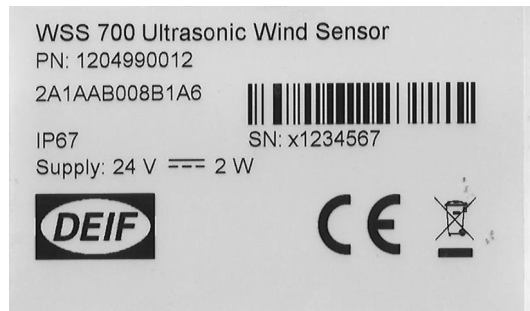
! IMPORTANT! The data bus must be terminated with a resistor (see technical specifications above) to secure stable operation!

i WSDI-2 terminal 8: in normal installations, it should not be connected to the cable shield; it must only be used if it is recommended or approved by DEIF Support.

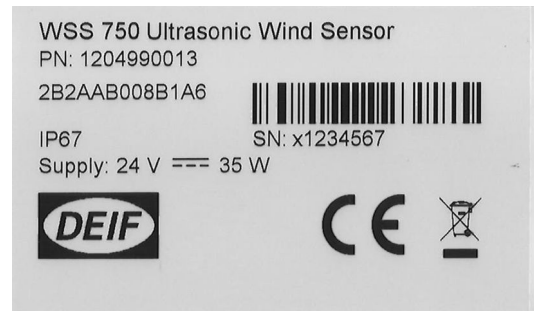
1.10 Labels

Product labels:

Product label, WSS 700

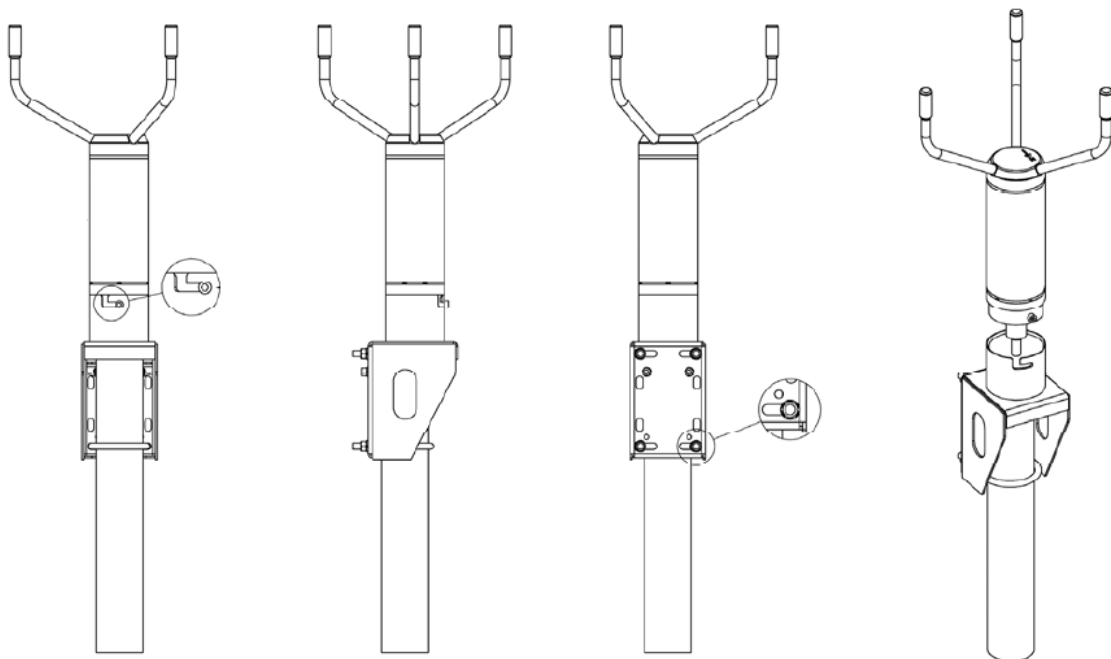


Product label, WSS 750



1.11 Mounting

Mounting on a vertical mast:



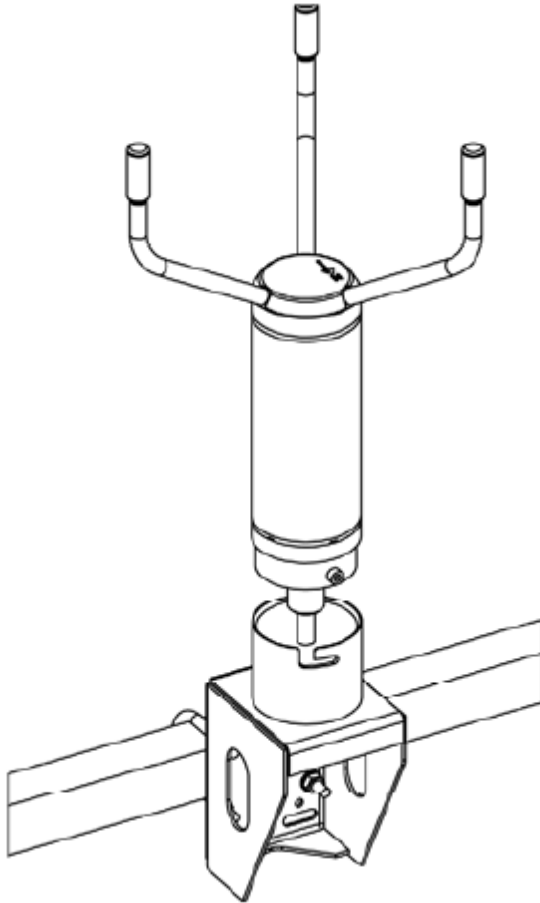
Two different U-bolt sizes are supplied with the WSS 700 series wind sensor (2 of each size).

Select the type that best fits your tube or beam.

Type 1 (small) up to 45 mm round or square mast or beam.

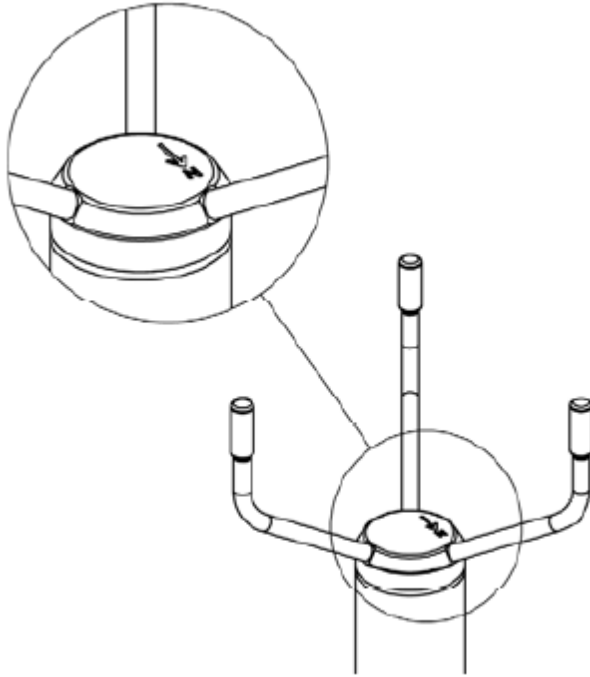
Type 2 (large) up to 65 mm round or square mast or beam.

Mounting on a horizontal beam:



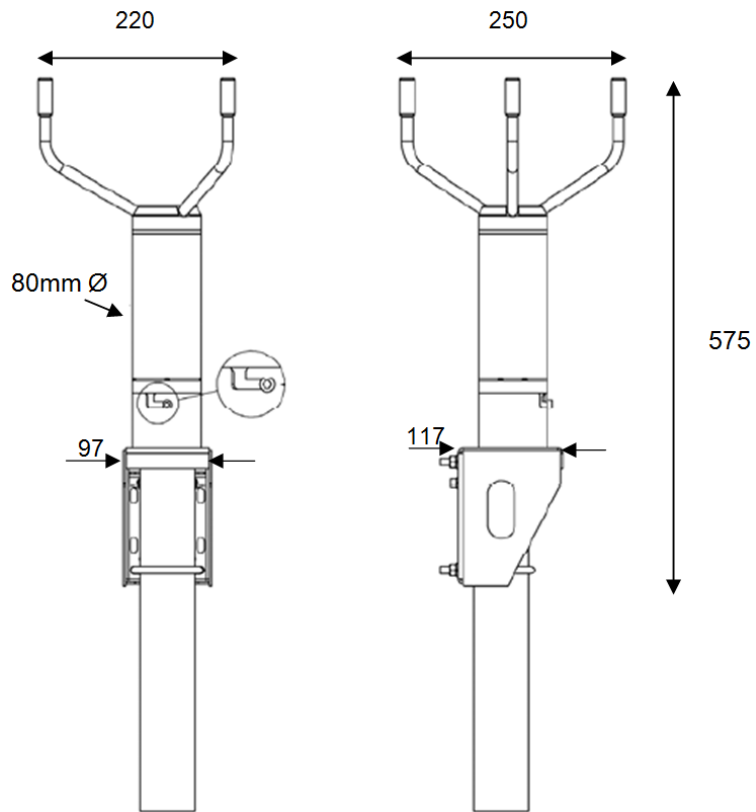
Aligning the sensor:

The arrow marked N must be parallel with the centerline of the ship and point ahead.

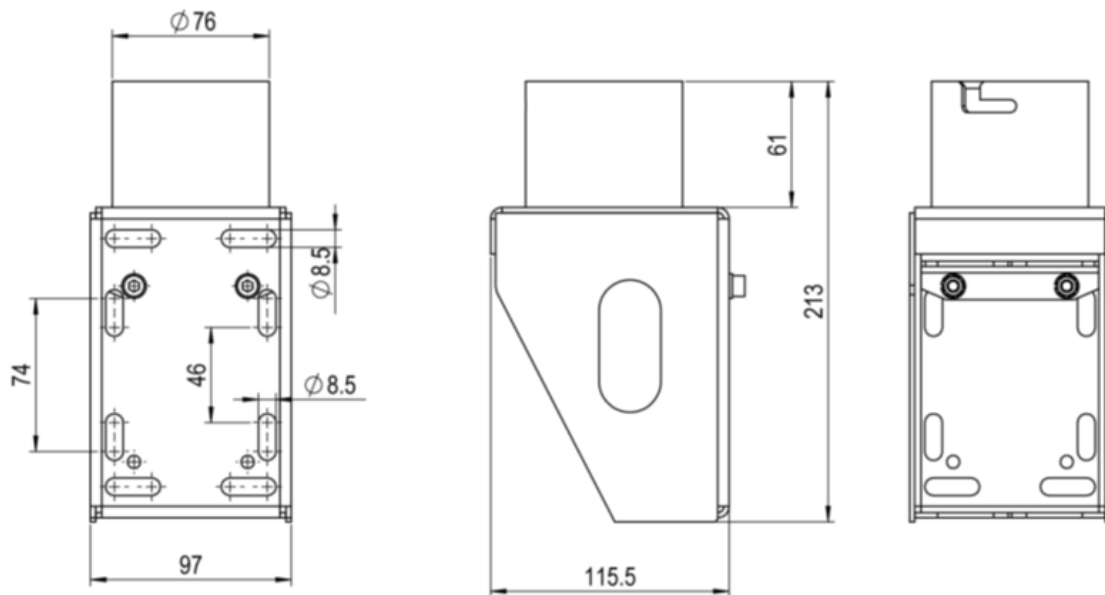


1.12 Unit dimensions

All dimensions in mm



Mounting bracket dimensions:



1.13 Available variants

Type	Variant no.	Description	Item no.	Note
WSS 700	06	Static wind sensor without heating	2958050060-06	Electrical compatible with WSS/WSS-L
WSS 750	07	Static wind sensor with heating	2958050060-07	Electrical compatible with WSS/WSS-L

1.14 Available accessories

Item no.	Variant no.	Description	Note
1020230019	04	Extension cable for WSS, 30 meters	
1020230020	05	Extension cable for WSS, 40 meters	
1020230021	06	Extension cable for WSS, 50 meters	
1020230022	07	Extension cable for WSS, 100 meters	
2035000008	08	IP66 connection box kit	IP 66 box, 2 x M20 cable glands for 5-13 mm cable and 5 position screw terminal block.

1.15 Order specifications

Variants

Mandatory information			Additional options to the standard variant		
Item no.	Type	Variant no.	Option	Option	Option

Example:

Mandatory information			Additional options to the standard variant		
Item no.	Type	Variant no.	Option	Option	Option
TBD	WSS 750	02	None	None	None

Accessories

Mandatory information		
Item no.	Variant	Accessory

Example:

Mandatory information		
Item no.	Variant	Accessory
1020230019	04	Extension cable for WSS, 30 meters
2035000008	08	IP66 connection box kit

1.16 Disclaimer

DEIF A/S reserves the right to change any of the contents of this document without prior notice.