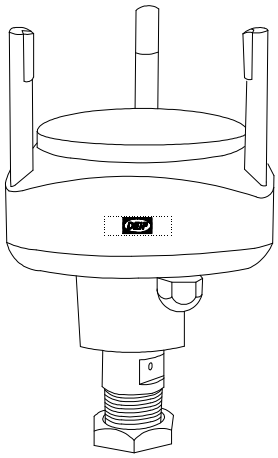
DEIF A/S

Installation Instructions

-power in control

Ultrasonic wind measuring system WSI, WSDI, WSS or WSS-L

4189350035A



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***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

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1. About this document

General purpose

This document is the Installation Instructions for DEIF's ultrasonic wind measuring system, the WSS or WSS-L. The document mainly includes general product information, mounting instructions, wiring of the wind sensor, interface box and display unit.
If WSS-L is not specifically mentioned in the following text, the term WSS covers both WSS and WSS-L.

The general purpose of these installation instructions is to give the user important information to be used in the installation of the unit.

Please make sure that you read this manual before starting to work with the WSS. Failure to do this could result in human injury or damage to the equipment.

Intended users

These installation instructions are mainly intended for the design engineer in charge of the electrical system. On the basis of this document, the design engineer will give the electrician the information he needs in order to install the WSS, e.g. detailed electrical drawings. In some cases, the electrician may use these installation instructions himself.

Contents/overall structure

This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.

2. Warnings and legal information

Legal information and responsibility

DEIF takes no responsibility for installation or operation of the wind measuring system. If there is any doubt about how to install or operate the WSS, the company responsible for the installation or the operation of the product must be contacted.

The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.

Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

Notes

Throughout this document, a number of notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

Note symbol

The notes provide general information which will be helpful for the reader to bear in mind.

Warning symbol

The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment, if certain guidelines are not followed.

3. General product information

Introduction

The WSS is an advanced wind sensor forming part of the DEIF Wind measuring system consisting of three components: The **wind sensor**, an **interface box** and 1-3 **displays** for indication of wind speed and wind direction.
The wind sensor is available in two versions:

- The WSS with a built-in heater, which will automatically engage when risk of icing occurs during low temperatures.
- The WSS-L without the heater is intended for applications in geographic areas where the risk of icing is very low or where occasional dropouts caused by icing are acceptable.

The WSS can also be used as a stand alone wind sensor providing data via an RS485 serial bus to connected systems such as dynamic positioning systems.

Type of product

The sensor is based on 3 ultrasonic transducers arranged in a triangle for measuring of wind speed and wind direction. By measuring the time it takes the ultrasound to travel from one transducer to the other two, the wind speed and the direction can be calculated.
One of the great benefits of this ultrasonic sensor is the total lack of moving parts, which increases the reliability and prolongs the lifetime of the sensor.

Installation options

Installation can be carried out using standard cable and connection box as specified in this instruction, but extension cable in variable length and either an IP66 installation box kit or an IP67 connector kit are available as accessories for easy installation of the sensor.

4. Mounting

Unpacking

The ultrasonic wind sensor type WSS is delivered in a cardboard box. Be careful when removing the device from the box.

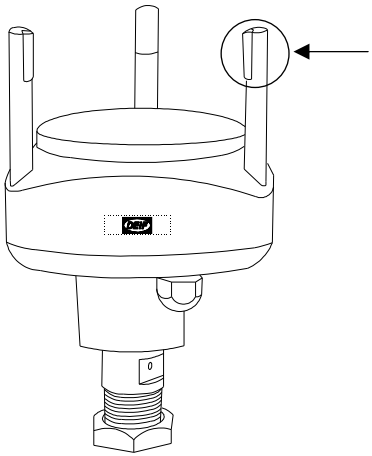
Make sure not to damage any of the ultrasonic transducers located at the top of the three antennas. Do not drop the device, as this may break or damage the ultrasonic transducers.

Selecting location

It is important to find a suitable location for the wind sensor WSS in order to get representative measurements of the wind speed and wind direction.

The wind sensor is to be installed at a location that is free from turbulence.

Mounting



Do not try to remove the 3 black rubber hoods.

The wind sensor is delivered with the mounting tap fastened on the actual sensor house. The tap and the sensor house are not to be separated, as this will damage the IP66 protection (waterproof protection).
The wind sensor can be mounted either onto a vertical pole where the top of the pole is equipped with min. 10mm of inner ¾" thread, or on a horizontal plate equipped with the same thread.

Do not expose the plastic part of the wind sensor to any torque when mounting the sensor; the tools used for fastening are only to be applied on the actual tap.

The lock nut on the tap can be used to fasten the sensor when the correct position is found. To ensure that the display represents the precise wind direction according to the ship, the wind sensor must be adjusted correctly. I.e. when mounting the wind sensor, the arrow printed on the bottom of the sensor must point towards the stem of the ship. On land-based installations the arrow must point towards north.

In order to protect the wind sensor and the personnel in the best possible way from lightning strokes it is recommended that a lightning rod is installed with the tip at least one metre above the wind sensor. The lightning rod must be properly grounded in compliance with all applicable safety regulations.

Make sure that the WSS wind sensor and interface box is grounded according to the instructions in this manual.

If there is a high risk of birds landing on top of the WSS and thereby interrupting wind measurements or even damaging the sensor heads (the black rubber heads may attract some birds), it is highly recommended to use the "WSS bird avoidance kit"!

5. Wiring

The wind sensor is supplied with 2 metres fixed cable. From factory, the cable is connected to the sensor via a waterproof gland, and this must not be replaced by another cable; the cable is extended by using a connecting box (Optional) or alternatively by using the optional IP67 connector kit.

For further protection of the cable between the wind sensor and the connection box, a metal conduit pipe is recommended.

Installation cable: 4 x 0.75mm^2 screened max. 300m, and max. 70nF capacity between the signal conductors.
Optional: Installation cable part no. 10 20 23 00 16 can be ordered in any length from 1 to 300 metres when ordering the WSS sensor.

The wind sensor cable screen and the installation cable screen should be connected in the connection box.

No supply voltage must be present during mounting and installation of the wind sensor, as this will damage the wind sensor.

6. Interface box

The interface box type WSI is connected between the wind sensor and the display(s). The interface box is supplied from an 18…32V DC supply able to deliver 0.9A at 24V DC (1.25A at 18V DC) and will then supply the ultrasonic transducers and the built-in heating element and at the same time convert the data signal for wind direction and wind speed into a TTL signal intended for the WSDI display. This is to make it possible to replace an existing wind sensor type 879.3c with our new sensor type WSS and to be able to connect the sensor to the existing display type 879.50/879.521. Please note that the new name for the display is WSDI. Besides, the already installed cable between the sensor and the display can still be used.

7. Display type WSDI

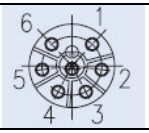
The display is connected to the interface box and is supplied separately from an AC power source of either 110V AC or 220V AC according to information on the label. The display type WSDI has an RS422 NMEA 0183 output version 1.5 or 2.x-3.0 according to information on the label. As regards changing of the NMEA version and reconfiguration of the supply voltage, see the User's Manual, document no. 4189350027.

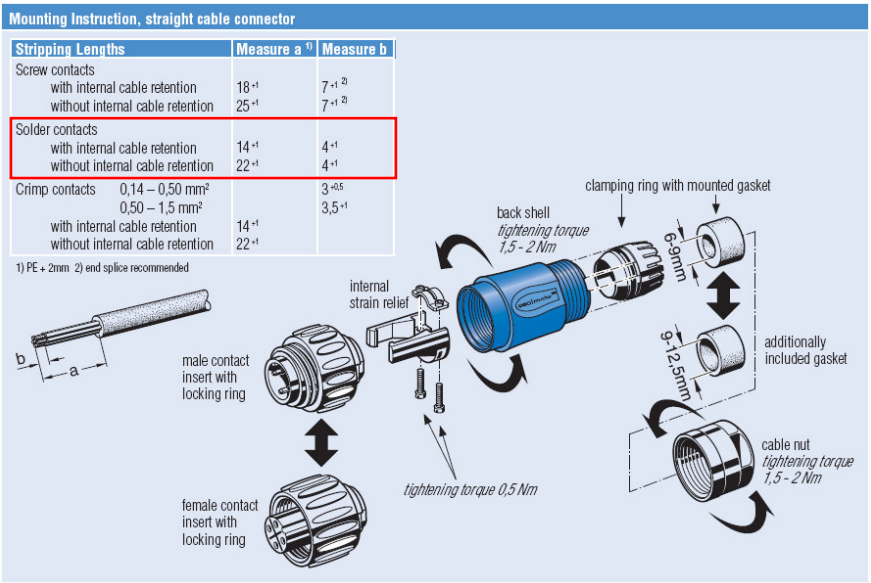
Connection between wind sensor - interface box - display(s)

Wind sensor WSS Cable colour	**Interface box WSI Terminal no.:**	**Display WSDI Terminal no.:**	**Comments**
Black (-)	9		30V DC supply for the WSS
Red (+)	7		
Orange	4 (A)		RS485 comm. from WSS
Brown	5 (B)		
Screen	6		Cable screen (and earth connection)
	1 (-)		Aux. supply 18-32V DC, 1.25A
	2 (+)		
	12 (0V)	2	Wind direction (D) and wind speed (S)
	11 (D)	4	
	10 (S)	3	
		5	Screen
		AC	Aux. supply 110V AC or 220V AC
		AC	
		GND	Ground
		1	+5V DC for external mode shift/dimmer
		A	NMEA output
		B	
		Screen	
		9	External mode shift/dimmer, see document no. 4189350009
		10	
		11	

Schematic drawing, see page 13.

IP67 Connector kit assembly (OPTIONAL)

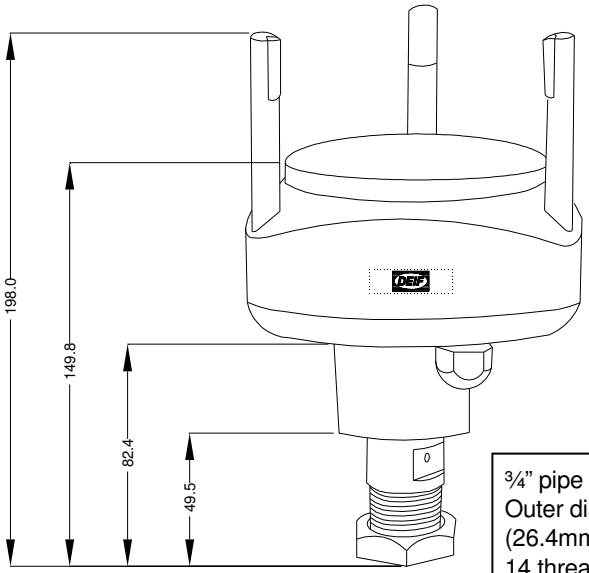
WSS/WSS-L fixed cable **Male connector**	**Connector pin no.**	**WSS extension cable xx meters** **Female connector**	**Signal comments**
Plug Male 7 pin. 10 22 00 00 52		Plug female 7 pin. 10 22 00 00 53	
Screw cap male, 10 29 92 00 02		Screw cap female, 10 29 92 00 03	
Black (-) ●	1	Black (-) ●	30V DC Supply for WSS/WSS-L
Red (+) ●	2	Red (+) ●	
Orange ●	3	Orange ●	RS485 Comm. From WSS/WSS-L
Brown ●	4	Brown ●	
Screen ●	5	Screen ●	Cable screen



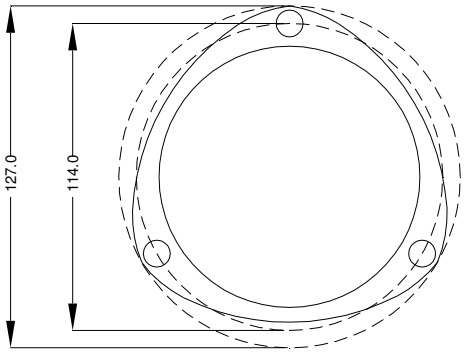
Measures are in mm.

8. Drawings

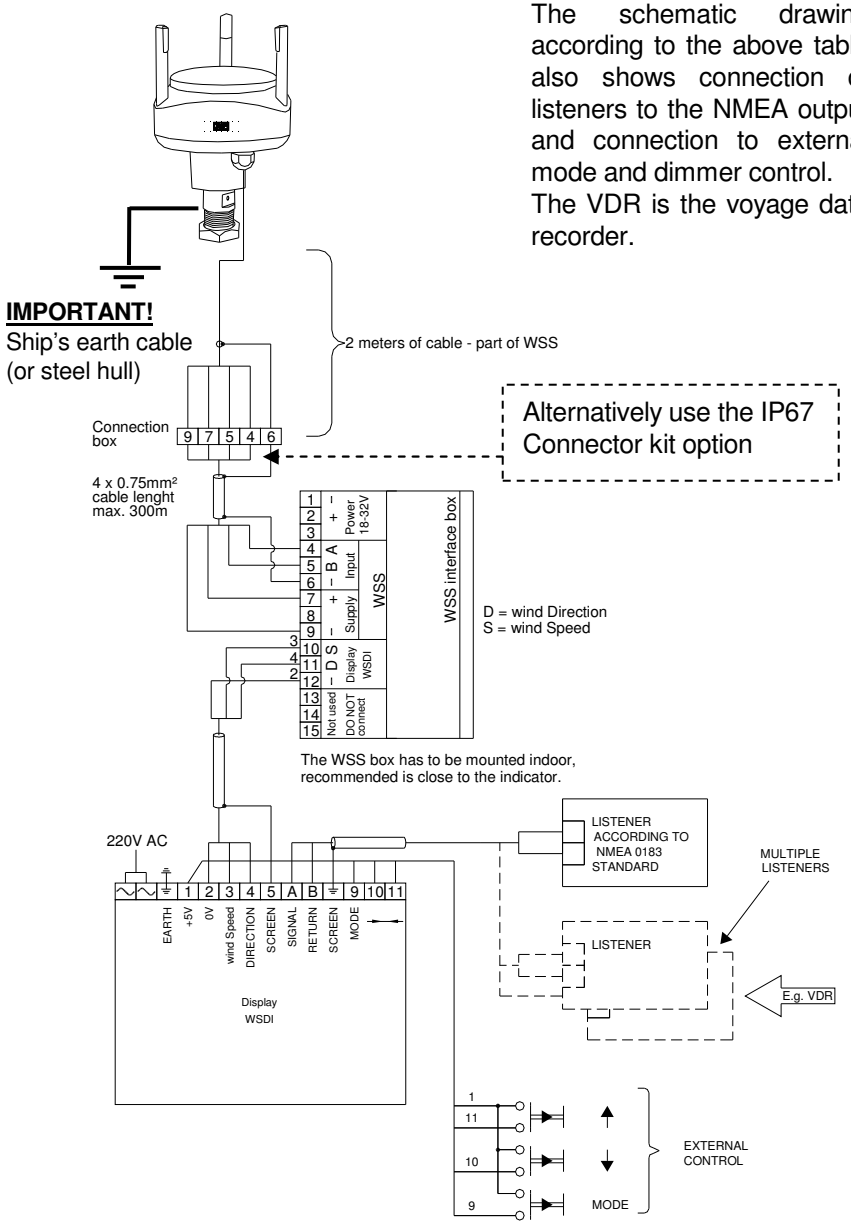
Wind sensor type WSS.



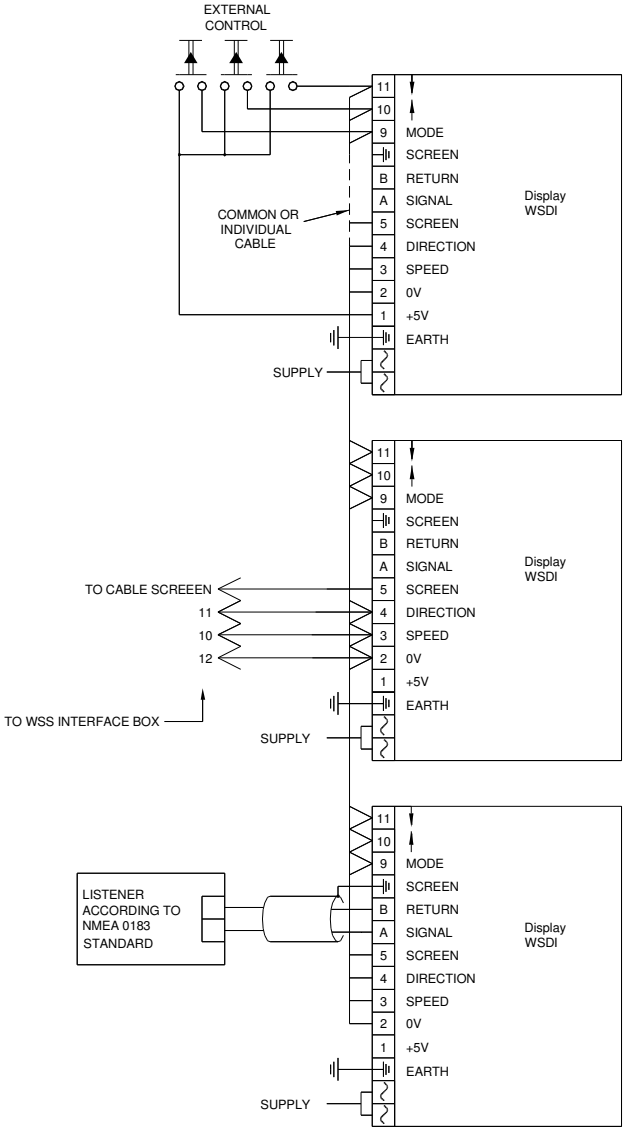
¾" pipe thread:
Outer diameter: 1.04 inch (26.4mm).
14 threads per inch.



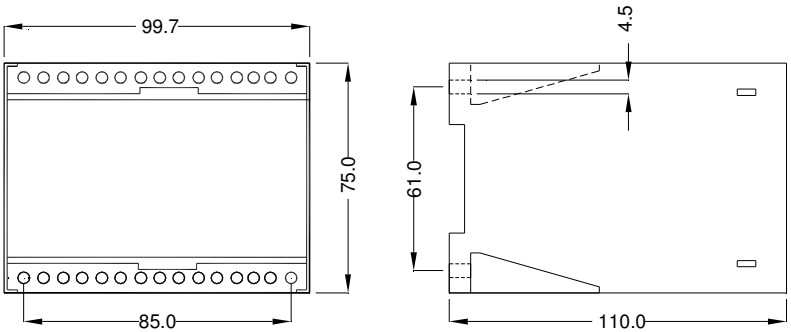
The schematic drawing according to the above table also shows connection of listeners to the NMEA output and connection to external mode and dimmer control.
The VDR is the voyage data recorder.

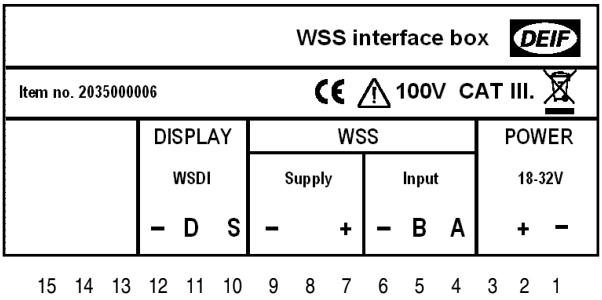


Connection diagram of 3 displays connected to one interface box and with common external mode and dimmer control.

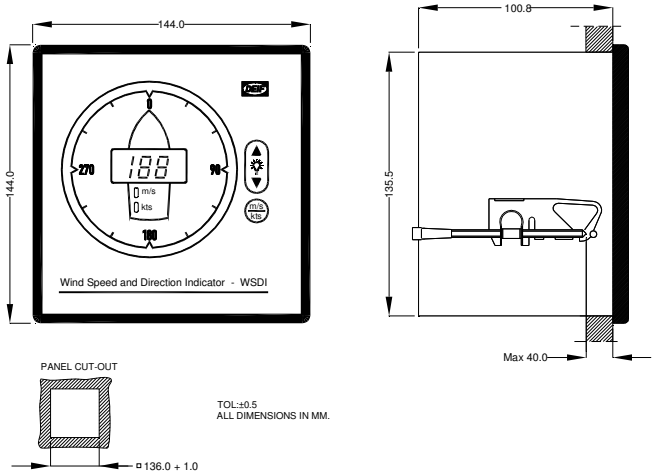


Dimensions and front label of the WSS interface box type WSI.



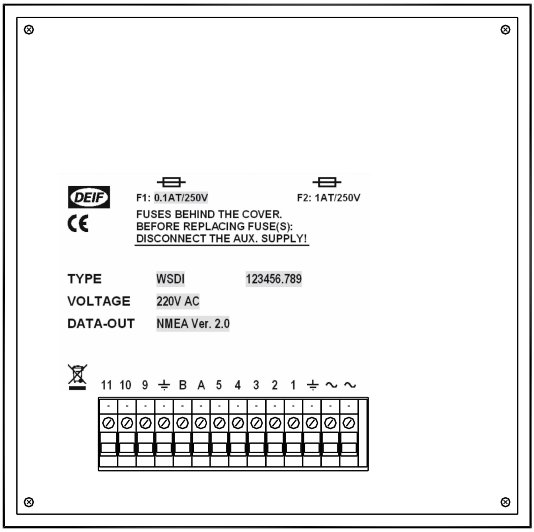


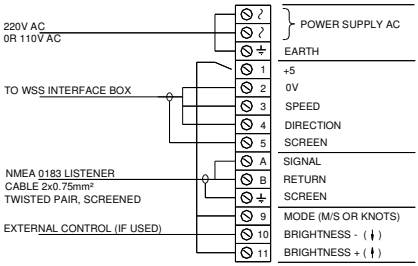
Dimensions and panel cutout of the display.



Rear side of the display WSDI.

If the instrument is installed in a metal panel, this panel has to be carefully earthed as well as the instrument itself, connecting the terminal marked EARTH.

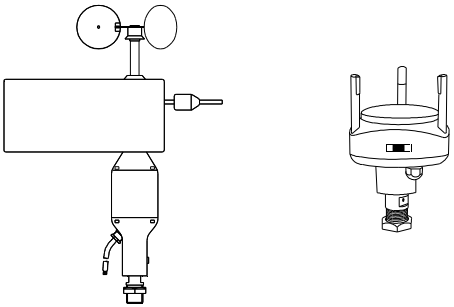




CONNECTION TERMINALS: MAX: 2.5mm² MULTI-STRANDED

4.0mm² SINGLE-STRANDED

9. Replacement of the old wind sensor type 879.3c by the new WSS



Remove the tap for the old sensor 879.3c and mount the new sensor. Notice that the tap is fixed on the new sensor and is not to be removed.

Mount the sensor so the arrow on the bottom of the sensor is pointing towards the stem of the ship.

Do not expose the plastic part of the wind sensor to any torque when mounting the sensor; the tools used for fastening are only to be applied on the actual tap.

The existing cable can be used. Before mounting the sensor with the existing cable, remember to disconnect the cable from the wind display WSDI.

The sensor is equipped with a 2m cable, this cable is connected to the existing cable using a junction box (normally already mounted).

The new sensor WSS cannot be connected directly to the existing display 879.50 or 879.521. An interface box WSI must be mounted in between. The interface box can be mounted anywhere between the sensor and the display(s), but the following must be taken into

consideration: The interface box has to be supplied from a 24V DC/1.25A source and mounted indoor, for which reason it is recommended to mount the interface box close to the existing display(s). Regarding dimensions of the box, see page 8; regarding wiring, see pages 4 and 6. Before the replacement is carried out, it is recommended to carefully read the Installation Instructions (this document).

If further information is needed, see the User's Manual, document no. 4189350027.

For technical specifications, see the data sheet, document no. 4921250059.

DEIF A/S reserves the right to change any of the above.