JRC

ALPHATRON Marine

Anemometer HD

WS-11

Operation & Installation Manual

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Contents

I Preface

Please read this manual before installation and operation of the equipment.

1 Revision History

Version	Description	Date
V1.0	First release	24 - October - 2018

Table 1: Revision history

1 Introduction

The Marine Anemometer WS-11 is an instrument for wind speed and direction. It can measure relative wind speed (accuracy ±5%, min 0.1m/s), relative wind direction (accuracy 1°).

The WS-11 wind sensor must be reading representative values for the wind and therefore the wind sensor must be reading clear wind, unobstructed by any wind shadow from structures.

System composition

Wind speed sensor	Wind speed sensor has a rotor with three wind cups.
Wind direction sensor	Wind direction sensor has a wind vane to drive an absolute angle sensor unit.
Holder	Used to install wind speed sensor and direction sensor for fixation of junction box.
Junction box	Consist of waterproof junction box and sensor unit transmitter.

Table 2: Sensor WS-11

Principle of measurement

The wind speed sensor has a rotor with three wind cups which spins as the wind moves past the boat. The Wind speed sensor measures how fast the rotor is spinning to calculate the wind speed.

The wind direction sensor has a wind vane which points in the direction that the wind is coming from. The wind direction sensor electronically senses the direction the wind vane is pointing.

2 Installation

Installation of wind sensor WS-11.

2.1 Wind Vane and Wind Cup installation

Wind Vane

The wind vane is installed on the top of the sensor holder, successively into black seal ring, plane washer, spring washer and 2 screw nuts. The two screw nuts should be tightened and then insert the cotter. See *Figure 1: Installation of wind vane and wind cup* on page 5.

Wind Cup

Wind cup is installed on the bottom of sensor holder, successively into plane washer, spring washer and 2 screw nuts. The two screw nuts should be tightened and then insert the cotter. See *Figure 1: Installation of wind vane and wind cup* on page 5.

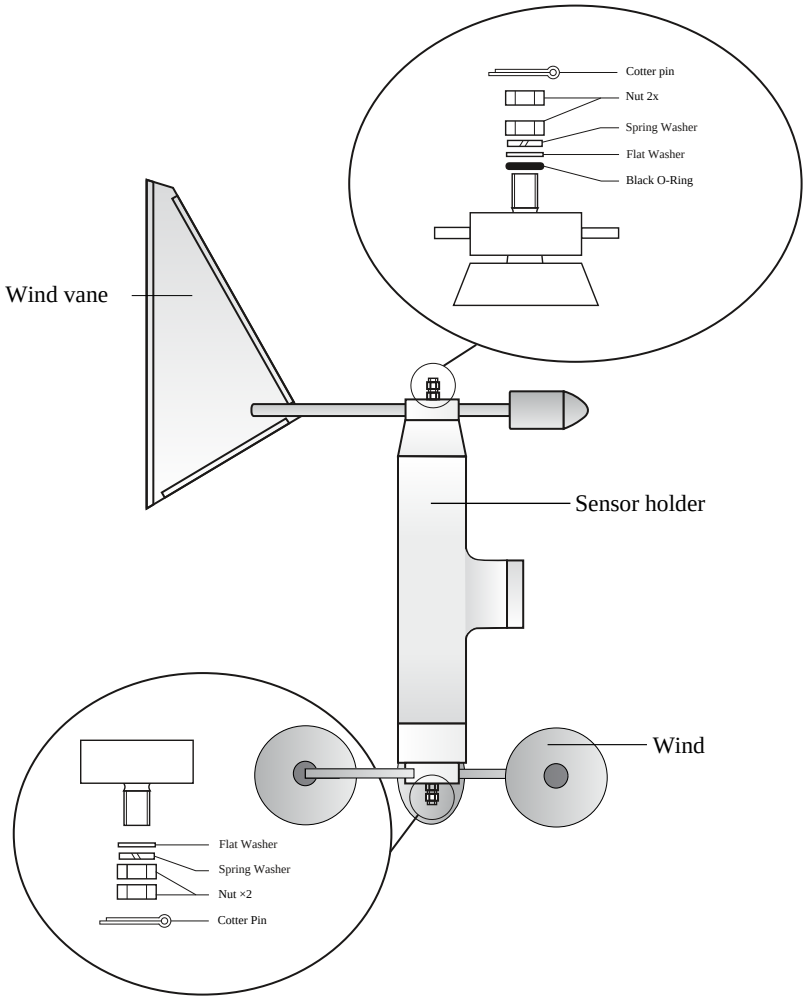


Figure 1: Installation of wind vane and wind cup

2.2 Integral Installation

Space and location

The total height of wind sensor is 838mm. It should be horizontally installed on a ventilated place of the ship. The action radius of wind indicator and wind cup is over 550mm.

Note a big radar antenna rotation can disturb the wind measurement. Find a location away from the radar.

Integral fixation

Use the U-bolt to fix the wind sensor. The best source of supporting is a tube with a diameter of 60mm. See *Figure 2: Installation of anemometer* on page 6

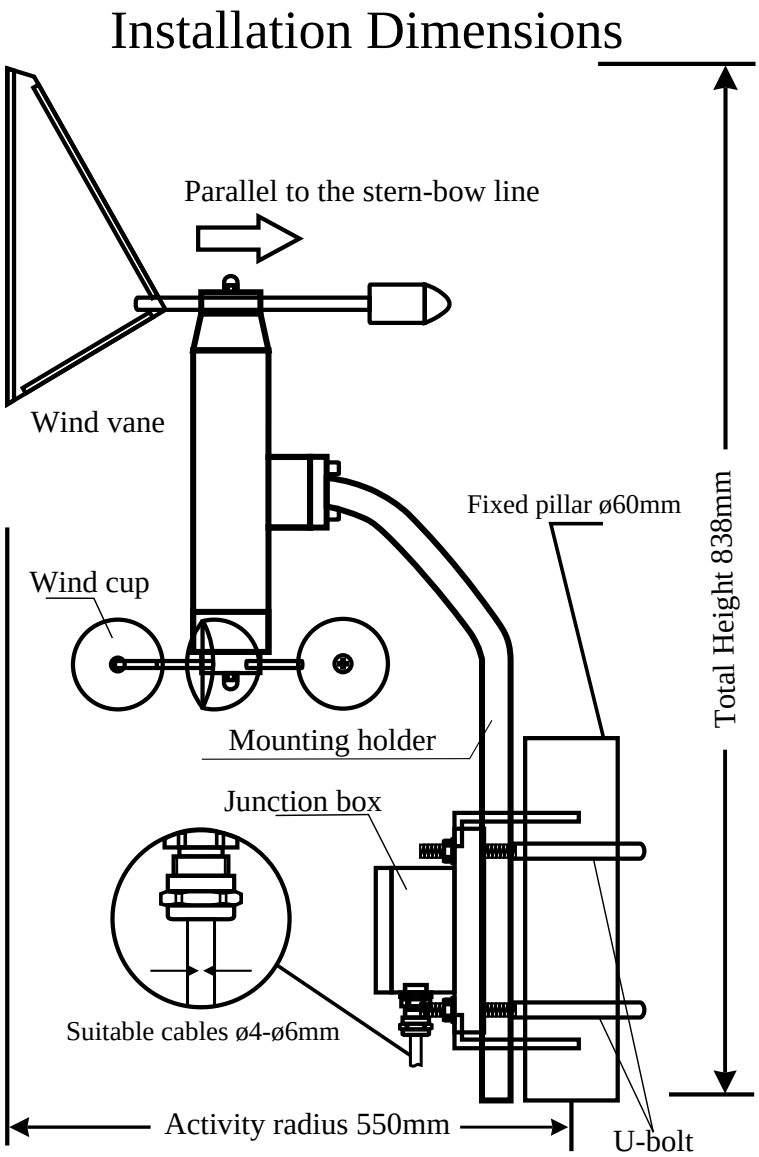


Figure 2: Installation of anemometer

Wiring

A 4-core screened cable with an external diameter of 4mm~6mm is connected with the 4 terminals +, -, B and A through the gland of the junction box. Please pay attention on the wire colors and sequence in order to connect correctly the wiring terminals of the back cover: 1+, 2-, 3B and 4A.

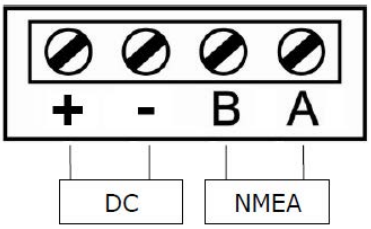
Junction box Terminals	Back cover Terminals	Connection
		1: +24V 2: 0V 3: -TxD 4: +TxD

Table 3: Wiring terminals

Calibration

After the installation of main unit of wind sensor, do the calibration of wind direction based on Calibration.

3 Calibration

After finishing the installation of the WS-11, calbration is needed.

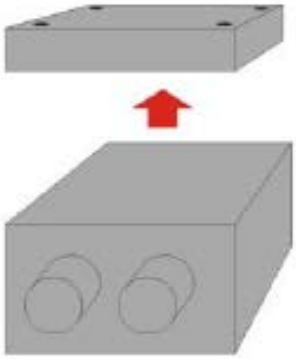
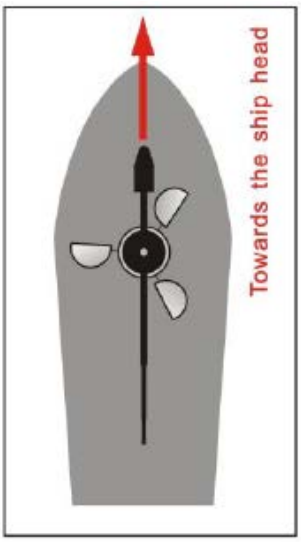
	Power up the WS-11
	Open the waterproof junction box.
	Hold and keep the vane parallel to the stern-bow line (fore direction).
	Inside the waterproof junction box, press the button. This saves the current position of the wind vane into the relative direction towards the ship head.
	Close the waterproof junction box.

Table 4: Wind direction calibration

4 Function and Operation

The output of the WS-11 is the NMEA sentence MWV. Below is the specifications of this sentence.

Data transmission is according to NMEA0183 standard.

Main Unit Output --MWV

$--MWV, x.x , a , x.x , a , A*hh<CR><LF>

① ② ③ ④ ⑤ ⑥

1. Wind angle, 0 to 359 degrees
2. Reference, R = Relative, T = True
3. Wind Speed
4. Wind Speed Units, K=km/h / M=m/s / N=knots
5. Status, A = Data Valid, V = Data invalid
6. Checksum

5 Specification

Power Supply	24 Vdc (20-32 V)
NMEA Baud rate	4800 bps
Data	RS422 with NMEA0183 Standard
Dimensions	Height: 838mm, Activity radius 550mm
Weight	10 kg

Table 5: Basic specifications

Working Temperature	-20°C ~ +85°C
Storage Temperature	-20°C ~ +85°C
Humidity	10% ~ 100% RH
Protection	IP56

Table 6: Environmental conditions

Wind Speed Range	0 ~ 60m/s
Wind Speed Accuracy	±5% (min. 0.1m/s)
Wind Direction Range	0 ~ 359°
Wind Direction Accuracy	± 1°
Min. Start speed	≤ 1.2m/s

Table 7: Technical specifications

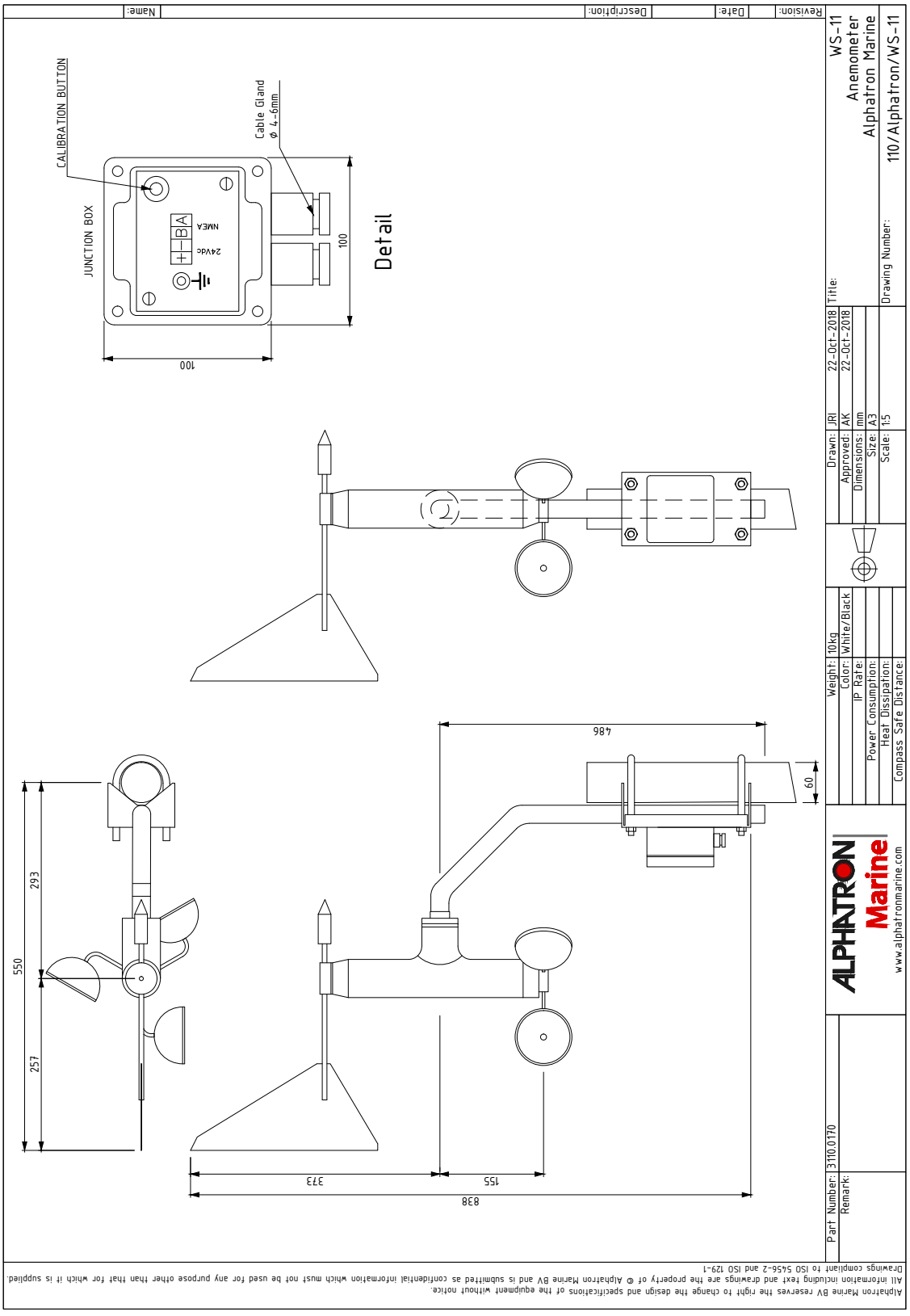
6 Maintenance

Ice or dirt on the sensor will disturb the normal working of the sensor. Please clear the sensor from ice and dirt in time.

Regulary check the external mounting bolts to avoid looseness and the abrasion and ageing of the cables.

When the equipment breaks down, contact an Alphatron Marine service engineer in time. Please do not do the service yourself.

7 Dimensional drawing



8 Appendix

Grade	Speed (m/s)	Speed (km/n)
0	0.0 ~ 0.2	<1
1	0.0 ~ 0.2	1 ~ 5
2	0.3 ~ 1.5	6 ~ 11
3	3.4 ~ 5.4	12 ~ 19
4	5.5 ~ 7.9	20 ~ 28
5	8.0 ~ 10.7	29 ~ 38
6	10.8 ~ 13.8	39 ~ 49
7	13.9 ~ 17.1	50 ~ 61
8	17.2 ~ 20.7	62 ~ 74
9	20.8 ~ 24.4	75 ~ 88
10	24.5 ~ 28.4	89 ~ 102
11	28.5 ~ 32.6	103 ~ 117
12	32.7 ~ 36.9	118 ~ 133
13	37.0 ~ 41.4	134 ~ 149
14	41.5 ~ 46.1	150 ~ 166
15	46.2 ~ 50.9	167 ~ 183
16	51.0 ~ 56.0	184 ~ 201
17	56.1 ~ 61.2	202 ~ 220
>17	≥61.3	≥221

Table 8: Wind grade table

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