



ALPHATRON  
Marine



# Anemometer

WS-12

Operation & Installation Manual

[www.jrc.am](http://www.jrc.am)

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# I Preface

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

## I.1 Revision History

Version	Description	Date
V1.0	First release	24 - October - 2018
V1.1	Sensor modification	17 - February - 2020

Table 1: Revision history

# 1 Introduction

The Marine Anemometer WS-12 is an instrument for wind speed and direction. It can measure relative wind speed (accuracy  $\pm 5\%$ , min 0.1m/s), relative wind direction (accuracy 1°).

The WS-12 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-12**

## 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.

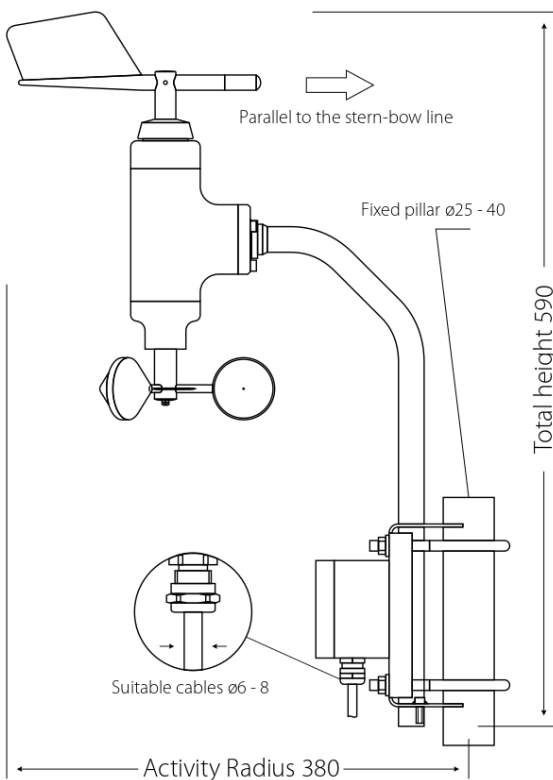
## 2 Installation

### Installation of wind sensor WS-12.

#### 2.1 Installation of wind sensor

The Wind sensor WS-12 should be installed in a place with free wind in the ship. The mounting holder has a diameter of 40mm and an active radius of 380mm. After finishing the installation of the main unit and the sensor, please make the calibration.

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



**Figure 1: Installation of anemometer**

Connect a 4-core screened cable with an external diameter of 6~8mm 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 the wiring terminals correctly.

Junction box Terminals	Connection
	1: +24V
	2: 0V
	3: -TxD
	4: +TxD
DC	
NMEA	

### 3 Calibration

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

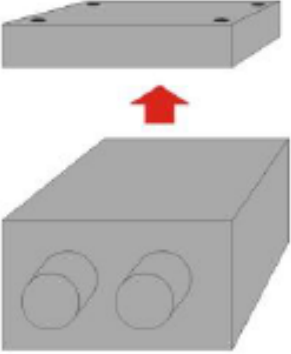
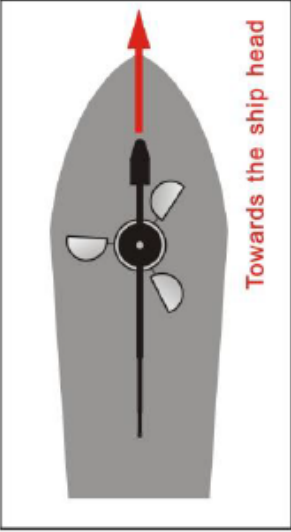

	<p>Power up the WS-12</p> <p>Open the waterproof junction box.</p>
	<p>Hold and keep the vane parallel to the stern-bow line (fore direction).</p>
	<p>Inside the waterproof junction box, press the button.</p> <p>This saves the current position of the wind vane into the relative direction towards the ship head.</p>
	<p>Close the waterproof junction box.</p>

Table 3: Wind direction calibration

## 4 Function and Operation

The output of the WS-12 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: 590mm, Activity radius 380mm
Weight	8 kg

**Table 4: Basic specifications**

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

**Table 5: 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	≤ 0.5m/s

**Table 6: Technical specifications**





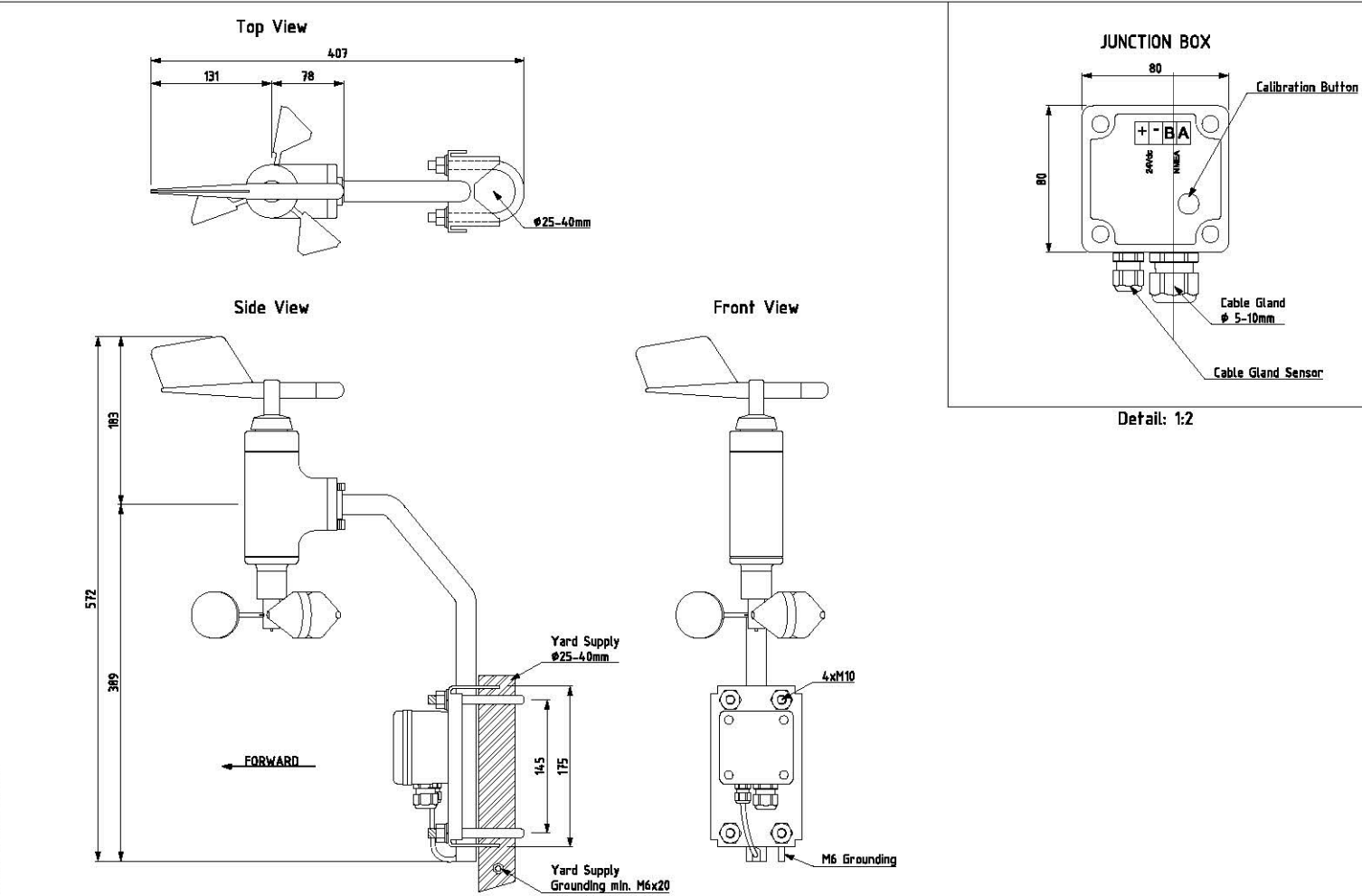
## 6 Maintenance

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

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

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

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 Drawings compliant to ISO 5455-2 and ISO 127-1



Part Number: G-004397	 www.alphatronmarine.com	Weight: Bkg	 4xM10	Drawn: JRI	13-02-2020	Title: WS-12 Anemometer Alphatron Marine
Remark:		Color: Black		Approved: AK	13-02-2020	
		IP Rate: IP56		Dim Units: mm		Drawing Number: 110/Alphatron/WS-12
		Power Consumption:		Paper Size: A3		
		Heat Dissipation:		Scale: 1:4		
		Compass Safe Distance:				

Revision: A Date: 13-02-20 Description: add junction box/frame number Name: JRI

## 8 Appendix

Grade	Speed (m/s)	Speed (km/h)
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 7: Wind grade table**

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close to the customer

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