WIRELESS WIND SPEED / DIRECTION SENSOR

MANUAL

Models:
WS 010-2 (wind speed sensor)
WSD 011-2 (wind speed and direction sensor)

PREFACE

Thank you for buying Navis anemometer sensor. This manual provides information for the best performance and safe application of the WS and WSD wind sensors. This manual does not cover the receiver/display unit, for which the manuals will come separately.
Read this manual carefully before starting the installation of the sensors. Keep this manual after installation for future reference.

PRODUCT LAYOUT (exploded view)

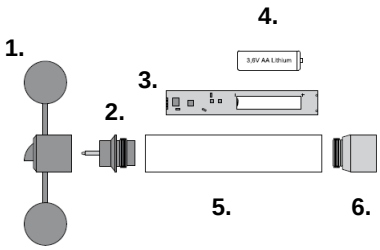


Figure 1. WS sensor

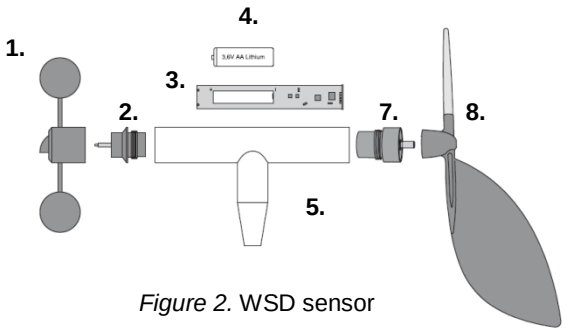


Figure 2. WSD sensor

1. Wind cups
2. Wind speed head with bearings
3. PCB - Electronic driving circuitry
4. Battery
5. Sensor main body
6. Aluminum bottom plug
7. Wind direction head with bearings
8. Wind vane

BEFORE FIRST USE

For enable sensor power supply remove protective foil from battery contact.
For sensor battery access please look at “BATTERY REPLACEMENT” section.

ASSEMBLY

The sensor is supplied with a battery inserted and is ready for installation.
Before installation insert the cups on sensor. Place the cups on axe and press the center part with moderate force to end position.
To remove the cups, grab them in the center part and pull from the axle with moderate force.

WSD sensor - attaching the aluminum rod holder (Figure 3.):

1. Insert the aluminum holder into opening o n sensor (step 1).
2. Insert (step 2) the screw into the assembly hole.
Check and adjust vertical alignment between sensor body and aluminium tube (step 3).
3. Tighten (step 4) the screw into the assembly hole.

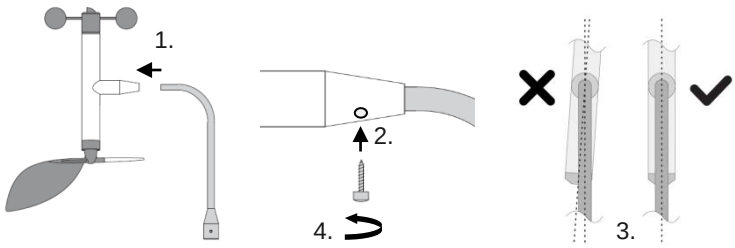


Figure 3. WSD sensor assembly

INSTALLATION

WS and WSD sensors to be mounted on 20 mm diameter vertical pool as shown on Figure 4.

At WSD sensor turn the N mark to Nord.
Calibrating of North is possible also after installation, on display unit.
Mount sensor to highest possible position with unobstructed air flow.
Use self-leveling mounting assembly (optional) if vertical sensor position can’t be ensured with vertical holder (for example at mobile cranes).

For maximum range there should be a clear and unobstructed line of sight between the sensor and antenna of display/receiver unit.

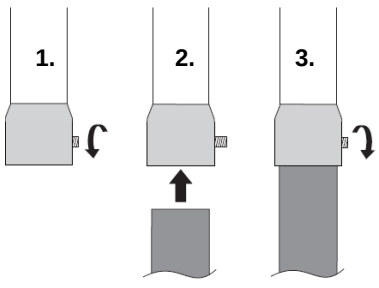


Figure 4. Sensor installation on vertical pool

OPERATION

Sensors continuously measure and transmit data of wind speed, wind direction and air temperature.
Data packets are transmitted every two second.
Refer to the display/receiver unit manual for instructions on how to connect the sensor and the display unit.

SENSOR ADDRESS

The sensor address is indicated on the label attached to the sensor and on sensor's PCB.
The receiver/display unit should be SET to this sensor address to receive the data from the particular sensor. Please follow the connection instructions from the selected receiver/display unit manuals.

OPERATING WITH MULTIPLE DISPLAY UNITS

Unlimited number of various types of compatible receiver/display units can read the data simultaneously from a single sensor, whereby all receiver/display units must be inside the sensor range with properly set selected sensor address.

RANGE

The connection between the sensor and the receiving unit works on free 902-928 MHz band. The operating range is up 1300 meters, assuming the sensor to be mounted at a height of 10 m and that there are no obstacles between the sensor and the display unit.
The range inside buildings is considerably shorter as the signal can be normally received through two to three walls. The range also depends on the type of receiver/display unit.

STORAGE

When not in use, it is recommended the cups to be removed, both, the cups and the sensor body to be placed into the original packaging.
Never store the sensor in a lying position with cups mounted. The cups will become deformed.

MAINTENANCE

Cleaning:

Cleaning can be done with a soft tissue or a cloth soaked in mild detergent. Never use aggressive solvents such as acetone. Make sure to use a proper force when cleaning the cups in order not to deform the cup arms.

Wind vane replacement:

Unscrew the screw on the top of the vane holder by turning it anticlockwise. Pull out the old vane. New vane place into a correct position and fix it with screw.

Battery replacement:

WS sensor	WSD sensor
Unscrew the aluminum bottom part by turning it anticlockwise (step 1). Pull out the PCB with the battery (step 2) and insert a new battery (1x 3,6V AA Lithium battery). Return the PCB with the battery and screw the bottom part back.	Take off the cups (step 1). Unscrew the upper head with bearings by turning it anticlockwise (step 2). Pull out the PCB with the battery (step 3) and insert a new battery (1x 3,6V AA Lithium battery). Return the PCB with the battery into the casing (be careful about proper position and orientation of PCB). Screw the upper head back to its original position and attach back the cups.

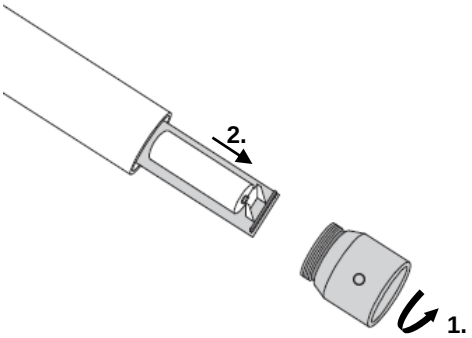


Figure 6. WS sensor battery replacement

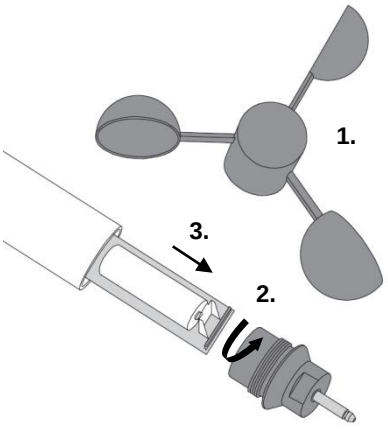


Figure 7. WSD sensor battery replacement

Bearings replacement:
If cups or wind vane not turns at low wind speeds, it is time to replace the head with bearings.
PROCEDURE FOR WIND SPEED HEAD WITH BEARINGS (*Figure 8*):
Remove the cups by pulling them off the axis (step 1). Unscrew the head with bearings by turning it anticlockwise (step 2). Mount back the replacement head and reattach the cups.
PROCEDURE FOR WIND DIRECTION HEAD WITH BEARINGS (*Figure 9*):
Unscrew the screw on the top of the vane holder by turning it anticlockwise and pull out the wind vane (step 1). Unscrew the head with bearings by turning it anticlockwise (step 2). Mount back the replacement head and reattach the wind vane.

Warning: Please make sure the washer to be greased for proper sealing!

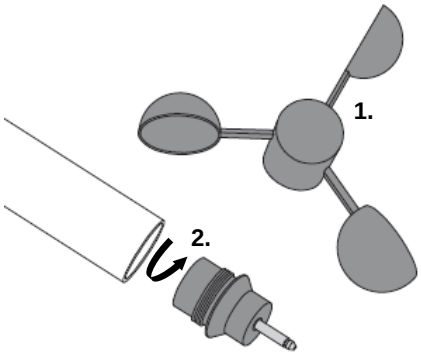


Figure 8. Cups bearings replacement

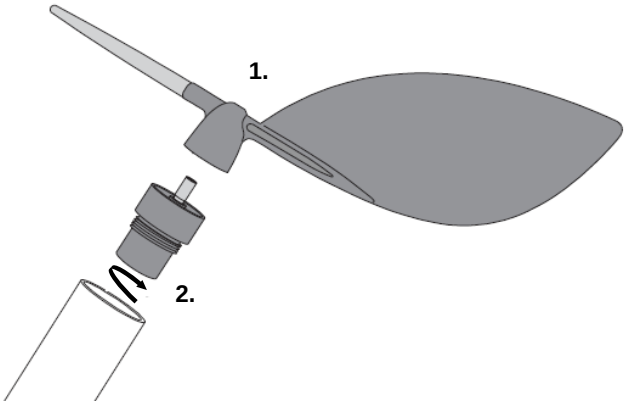


*Figure 9. Wind vane b*earings replacement (wind speed/direction sensor*)*

TROUBLESHOOTING

Symptom	Action
The receiver/display unit cannot read the sensor	- check if correct sensor address is set in display unit - check the sensor battery – replace the battery if needed - check the operation at a reduced distance to the display/receiver
Interrupting and weak sensor signal	- check for obstructions between sensor and display/receiver unit, - place the sensor or display/receiver on a different position with better signal reception - reduce distance to the display/receiver - change or add an antenna at display/receiver unit
Cups do not turn at low wind speeds	- take off the cups and check bearings - replace the head with bearings if necessary

FCC INSTRUCTION TO THE USER

IMPORTATN! Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC ID: 2AK8G-NAVIS-WS01

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radi-ate radio frequency energy and, if not in-stalled and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/ TV technician for help.

TECHNICAL DATA

Wind speed measurement range:	0,6 - 50 m/s
Temperature measurement range:	-30 ^{0}C ... +55 ^{0}C
Data transmission rate:	every 2 seconds
Wind speed measurement resolution:	0,1 m/s
Temperature measurement resolution:	0,5 ^{0}C
Accuracy wind speed:	+/- 2,5 %
Accuracy temperature:	+/- 1 ^{0}C
Operating frequency:	902 - 928 MHz
Temperature operating range:	-30 ^{o}C …+55 ^{o}C
Battery:	1 x 3,6V AA Lithium battery (included)
Battery life time:	up to 3 years
Bearings (replaceable):	2 x precision stainless steel Ball bearing
Material - cups (replaceable):	PA (Polyamide)
Dimensions (WS sensor):	height 210 mm, overall diameter cup to cup 120 mm
Mounting:	sensors to be mounted on a vertical pipe with 20 mm diameter

ADDITIONALLY FOR WSD SENSOR

Wind direction measurement range:	0 - 360^0, no blank sector, contactless magnetic measuring principle
Wind direction resolution:	1 ^{0}
Accuracy wind direction:	+/- 2,5 ^{0}
Dimensions (without holder):	height 240 mm, overall vane diameter 220 mm
Battery life time:	up to 2 years
Bearings (replaceable):	2 x precision stainless steel Ball bearings

Subject to technical modification without notice.

MODELS

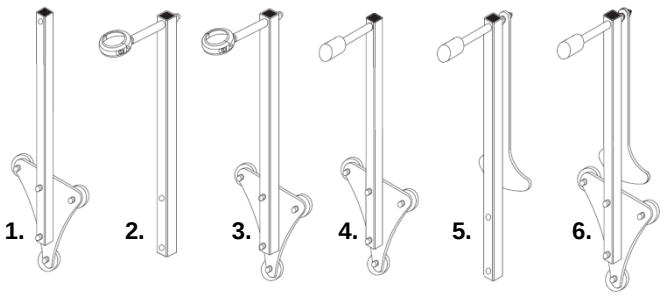
WS 010-2 - wind speed sensor
WSD 011-2 - wind speed and direction sensor

OPTIONS

- individual wind tunnel tested sensors with calibration report
- full ceramic bearings

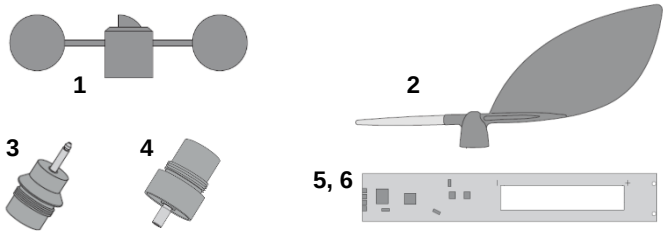
SENSOR MOUNTING ACCESSORIES (optional)

1. Magnetic mounting assembly (for WS sensor)
2. Self-leveling mounting assembly (for WS sensor)
3. Magnetic self-leveling mounting assembly (for WS sensor)
4. Magnetic mounting assembly (for WSD sensor)
5. Self-leveling mounting assembly (for WSD sensor)
6. Magnetic self-leveling mounting assembly (for WSD sensor)



REPLACEMENT PARTS

1. Spare anemometer cups
2. Spare wind vane
3. WS sensor head with bearings (for WS and WSD sensor)
4. WD sensor head with bearings (for WSD sensor)
5. WS sensor PCB
6. WSD sensor PCB



WARRANTY (LIMITED)

The warranty period of NAVIS products is one year after the date of purchase. During limited warranty period any defective product will be repaired or replaced with comparable product without charges. The claimed product will be repaired or replaced only when returned to the store where it was purchased together with original invoice. Failure to follow these instructions may invalidate the warranty. The limited warranty does not cover battery and damages of any kind including physical damages caused accidentally or misuse of the product. NAVIS does not accept responsibility for any problems which may arise from applications other than the product was designed for. Any liability for direct or indirect damage caused by product failure is excluded.

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NAVIS elektronika d.o.o., Poljska cesta 11, SI-1241 Kamnik, info@navis-elektronika.com