SONIC-ANEMO-ANA5 Ultrasonic Wind Sensor, 0-5V outputs

User manual

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LCJ Capteurs
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The products manufactured by LCJ Capteurs are constantly developed. Therefore, the content of this manual can be amended without notice.

This manual does not create any legal bond between LCJ CAPTEURS and the customer of final user and LCJ CAPTEURS does not assume any responsibility for any damage and/or injury resulting from the use of the product described in this manual.

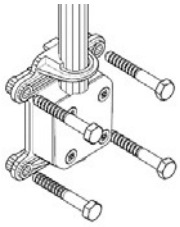
SONIC-ANEMO-ANA5

ULTRASONIC WIND VANE-ANEMOMETER 0-5V

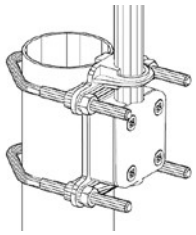
Thank you for purchasing the SONIC-ANEMO-ANA5. Your ultrasonic wind sensor is easy to set for operation thanks to the wide range of power supply – 5 to 32 V – and the 0-5 V output format. The wind gusts are detected by a 533 ms measurement frequency.

Quick Installation:

1- Mount the sensor. Several mounting options are available:



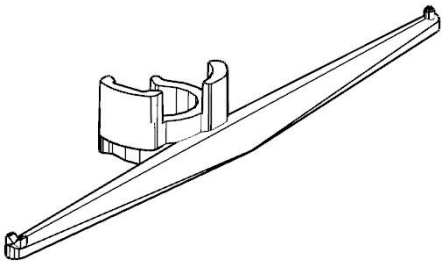
Panel



Mast

2- Connect and power the sensor.

3- Align your sensor with the supplied tool.



4- Your sensor is ready to use.

I. General information

A. About this manual

This manual brings all required information to install and use the SONIC-ANEMO-ANA5.
Read carefully all information contained in this manual before using the sensor, as misuse can drive to mistakes and damage the product.

B. Warnings

Important points are highlighted in this document as follow:

Alert! Serious hazard. Read carefully and follow the instructions. Heavy risk of injury or even death.

Caution: Potential hazardous situation. Read carefully and follow the instructions to avoid damages on the product or loss of important data.

Note: Important information regarding use of the product.

C. Your experience

LCJ CAPTEURS values your feedback and suggestions to improve this manual. Should you find any mistake, please contact us indicating the chapter, section and page to correct. You can find our details on this manual's cover page and on our website www.lcjcapteurs.com.

D. Safety

When using the product, safety measures described below must be followed to avoid damages and legal responsibility. Follow all safety and use instructions regarding the product. Follow all warning notices indicated in the product's use instructions. The following instructions are meant to reduce all risk of personal injuries, electric shock, fire and damage of the equipment.

Read carefully and follow all instructions contained in this manual to avoid measures errors caused by misuse.

Alert! Follow all safety measures applicable for the product's installation.

Electric safety measures

This product has been designed to be powered according to the specified voltage range. Any other power supply can be hazardous and will result in the product's unconformity.

E. Recycling

LCJ Capteurs encourage recycling all material when possible, following local regulations. You can find more details about recycling by contacting the local authorities in charge of Environment Protection in your country.

F. Warranty

Your LCJ CAPTEURS product is warranted against manufacturing defects in materials and workmanship for a period of 24 months from the date of purchase. LCJ CAPTEURS will at its discretion, repair or replace faulty product free of charge in their premises. The warranty does not cover the installation labour and shipping costs of the faulty parts. A proof of purchase can be asked when processing the warranty claim by written. Once LCJ CAPTEURS approve the warranty claim, the sensor must be sent to their workshop address. LCJ Capteurs guaranties that each wind sensor is tested and calibrated before despatch.

The warranty does not apply in the following cases:

1. Damage resulting of misuse.
2. Improper installation or inappropriate conditions of operation.
3. If the product has been damaged, open or repaired by a non agreed agent.
4. Damage resulting from lightning, fire or any similar circumstances.

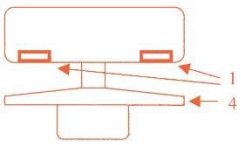
Warranty is void if operation, use, installation and technical service instructions have not been followed and if a repair has been done without prior agreement.

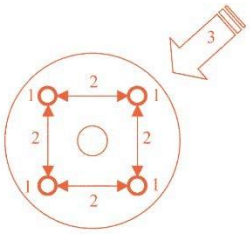
G. Product return

Contact your dealer prior to returning a product to LCJ CAPTEURS. A Return Merchandise Authorisation (RMA) must be issued and received before sending a product back.

II. Introduction

A conventional wind vane-anemometer includes mechanical rotating parts. These parts are subject to wear and they represent sources of failure of the sensor. Our ultrasonic sensor has been designed to avoid this and the ensure a reliable and stable operation. This Wind-vane-anemometer shows very stable results on a long term and with no maintenance.





The sound (and ultrasound) is conveyed by the movement of the fluid in which it crosses. The electro acoustic transducers (1) communicate between themselves two by two using ultrasonic signals (2) to determine, following the orthogonal axes, the wave transit time differences induced by the air flow (3). The measurements are combined in an integrated calculation to establish the wind speed and its direction in relation to a reference axis. The temperature measurements are used for calibration corrections. The shape shown in (4) partially corrects the effects of tilt angle of the sensor against wind module. For the CV7 range sensors, transducers communicate laterally, which results in four independent measures. The validity checks are then strengthened and vectors measured windward are prioritized for wind speed and direction calculations. This method gives a sensitivity of 0.12 m/s for wind speed, an excellent wind module dynamic and linearity up to 40 m/s (144 km/h).*

LCJ Capteurs has designed and manufactured wind sensors since 1999. Our range of wind vanes/anemometers covers the needs over many applications. They have proved their robustness and accuracy on the marine sector, and they are now widely used in other fields such as weather stations, industry, security and agriculture to name a few.

At LCJ Capteurs, each sensor is fully tested before despatch and the test results are saved against the serial number. The sensor is placed in our wind tunnel on a bracket that rotates by 9 degrees steps. This is Computer Controlled. The sensor is aligned at 0 degrees of the air flow and then, 40 measure points are completed with data saved for speed and angle.

III. Installation

A. Control the delivery

Before opening the box, check it carefully to spot eventual damages that can occur in the transport. If the packaging is damaged, fill in a Freight Claim with full description of the problem.

B. Opening the box

Unpack the parcel in a dry and clean place and check the content of the delivery:

1. SONIC-ANEMO-ANA5 with cable.
2. Mounting bracket with 4 nuts.
3. Alignment tool
4. User manual (paper).

Warning: Unpack the product with care to avoid any damage

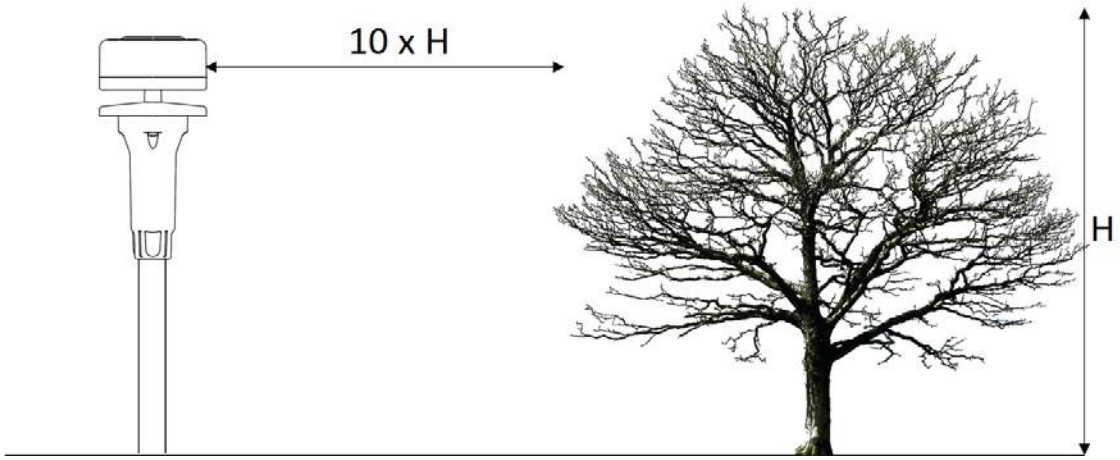
C. Choose the best location

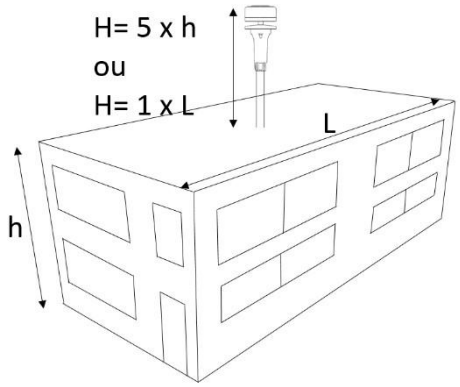
The choice of the appropriate installation location is crucial to get relevant measures. The location must be free of turbulences and magnetic field resulting from electricity, engines, radio transmitters, radars, etc. Any land edge or object near the sensor can have a negative impact on the measures. For mobile installations, consider that the sensor measures the apparent wind speed and angle. This has to be integrated in the data process to calculate the true wind vector.

1) Clearance distance

To avoid errors on measures, the sensor must be installed at a distance of at least 10 times the height of the nearest obstacle.

We recommend installing the sensor at a height of 3 metres in clear environment and 10 metres in presence of nearby objects.

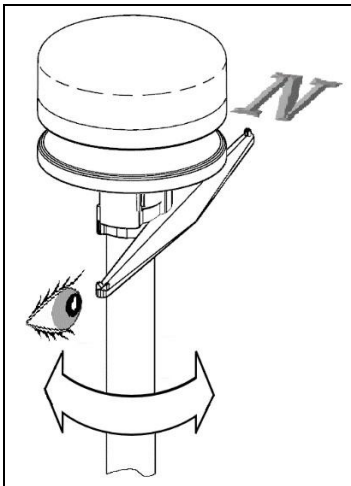




2) Height of mounting

When the sensor is installed on the top of a building roof, the installation height must be equal to the building's length or, if possible, 5 times the building's height.
Install the sensor in the middle of the roof when possible. It is not recommended to install a sensor on a slanted roof. Indeed, these roofs generate upwards turbulences that will affect the sensor.

3) Alignment of the sensor



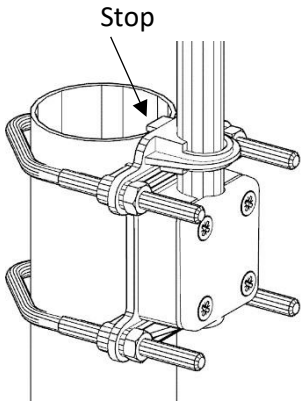
The sensor must be aligned to North. An alidade is supplied for that. Clip the alidade on the tube and slide it so that it snaps into the dedicated slots. Do not tamper with the slots. The alidade must gently find its place.
Slightly loosen the 4 screws that hold the tube. Align the alidade – and the sensor –to the North. Tighten the screws.

Note: Magnetic deviation must be considered to refer the measures to True North.

4) Mounting methods

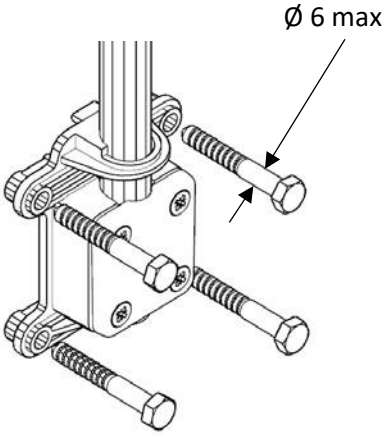
The SONIC-ANEMO-ANA5 comes with a mounting bracket allowing two mounting methods:

On a pole:
Pole diameter: Ø 35 mini ; Ø 48 maxi.



Max. tightening torque: 1.5 N.m

On a vertical surface:
(the sleeper screws are not supplied)



D. Wiring and power supply

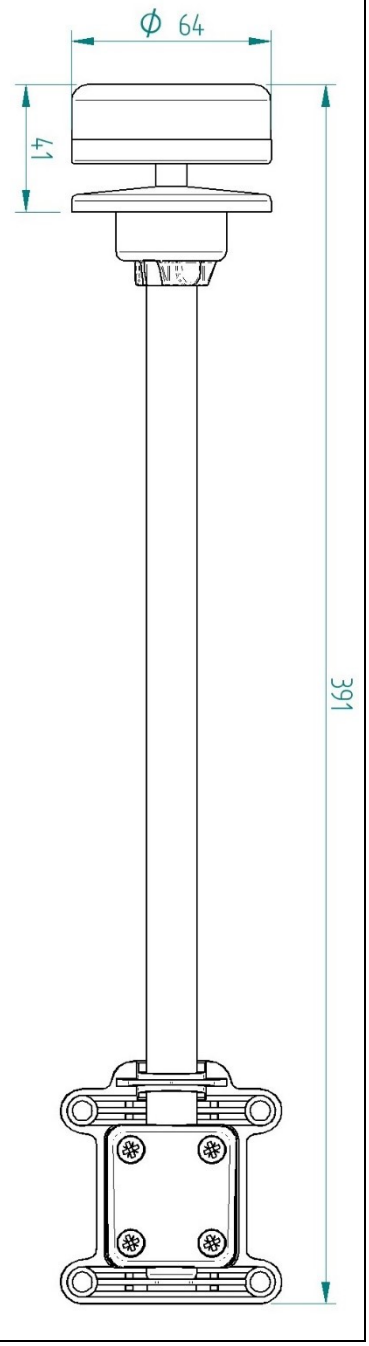
Three wires for analogue data: Yellow: wind speed Green: wind angle White: 0 V Black: Shield (thermo-sheathed braid)	Two wires for power supply: Brown: positive Grey: 0 V

SONIC-ANEMO-ANA5 can be powered with a voltage ranging from 5V to 32V.

IV. Technical specifications

Dimensions

Sensor: Ø 64 mm ; height: 41 mm
Weight: 100 g
Length of cable: 5m



Measurement range

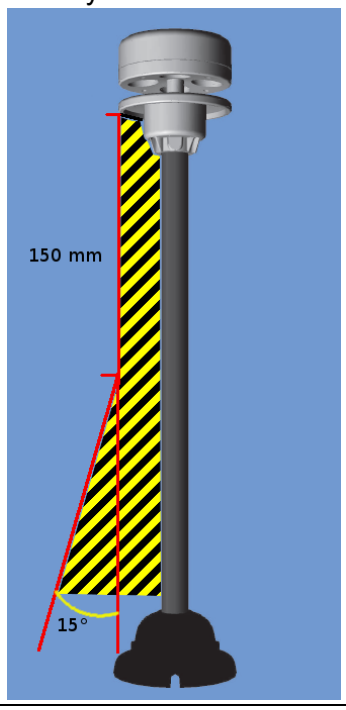
Wind speed:

range: 0.12 to 40 m/s
Accuracy: ±0.5 m/s
Resolution (10 bits): 0.05 m/s

Wind angle:

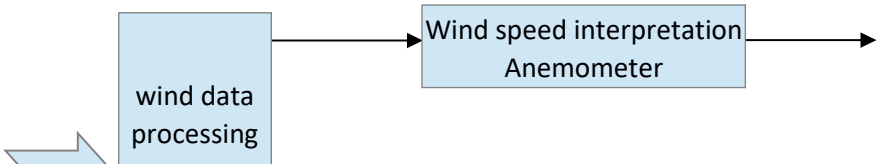
range: 0 to 359 degree
Resolution (10 bits): 1 Degree
Accuracy: ±1.5 Degree

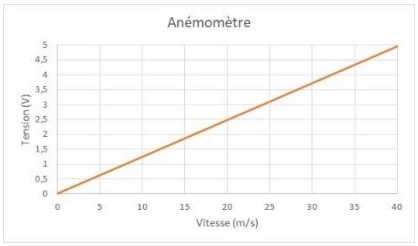
Shaded area: keep clear of any obstacles



The wind sensor features both anemometer and wind vane functions. Wind speed and angle are given through a 0 to 5V voltage signal. The sensors' features are checked in our wind tunnel.

A. Synoptic





B. General information

Data Update: 533 ms
min: 5 V DC
max: 32 V DC
Cable: 6 wires, length of 5 m.

C. Anemometer and Wind Vane Specifications

1) Wind speed range:	2) Wind angle range:
0.12 to 40 m/s Resolution: 0.05 m/s Accuracy: ±0.5 m/s	0 to 359 degrees Resolution: 1 Degree Accuracy: ±1 Degree

D. Electric specifications

1) Power consumption (tbc):

VDD (V)	mAh
3.6	9.5
7.2	5
9.6	5
12	2.6
14	2.6
18	2.6
24	2.5
27	2.5

2) Connection

Three wires for analogue data: Yellow: wind speed Green: wind angle White: 0 V Black: Shield (thermo-sheathed braid)	Two wires for power supply: Brown: positive Grey: 0 V

3) Output signals

The Ultrasonic sensor uses two DAC (Digital-Analogique-Converter) to convert wind speed and angle. Value to convert range from 0V to 4.96V. The DAC are used with a 10 bits resolution. The maximum permissible current is 24 mA (15 mA typical).

Transfer functions:
Anemometer V(kt)= Vout/Vdd*80*1024/1023
Wind Vane: A(°)= Vout/Vdd*359*1024/1023

E. Mechanical specifications

Operational conditions: -15°C (no frost) to +55°C.
Material: aluminium, high performance thermoplastics.

V. Maintenance

The SONIC-ANEMO-ANA5 does not require any particular maintenance.

Warning: Do not use alcohol base cleaning products. Use a clean soft cloth and clear water or a neutral cleaning product.

VI. Declaration of Conformity

LCJ Capteurs certifies that the following product:

SONIC-ANEMO-ANA5, ultrasonic wind vane-anemoneter

complies with the provisions of the following directives:

1. Electromagnetic Compatibility: 2004/108 / CE
2. Low voltage: 2006/95 / CE

This declaration of conformity is based on the product's compliance with the following harmonised standards:

1. Electromagnetic Compatibility: EN 55022

Date of issue: 24/10/2016 Signed by:

Christophe MICHEL

Title: CEO