

# Wind Anemometer WS-S-CL Marine Model



- ships, tug boats, oil rafts, seaports,
- power stations, meteorologic station,
- tanks, towers, airports, cranes etc.
- non corrosion materials  
(stainless steel, polycarbonate)



**Rehn Instruments**  
Suunnittelutoimisto  
Reino Rehn Ky

Electronics  
Mechatronics  
Meters

Leppästentie 110  
33450 SIIVIKKALA  
FINLAND

Tel. +358-3-3460 222  
Fax. +358-3-3460 229

e-mail rehn@iki.fi  
<http://www.rehn.info>

# Wind Anemometer WS-S-CL Marine Model

## Description

WS-S-CL-MM (Marine Model) is an integrated wind anemometer equipped with current loop outputs. It can be directly connected to meters, measurement computers, weather stations, data loggers or plotters which have standard current loop terminals. The sensors are closely fitted to the transmitter unit and it can be mounted as such on the top of the instrumentation mast.

Transmitter unit is equipped non isolated current loop. Isolated loop is optional module.

Transmitter is protected against lightning with varistors.

All materials are selected for marine use.

## TECHNICAL DATA :

|                               |  |
|-------------------------------|--|
| Anemometer Type:              | : WS-S-CL-MM (Marine Model)                          |
| Starting treshold             | : 0.7 m/s  |
| Measurement range             | : 0.8...60 m/s, max. 60m/s                           |
| Accuracy                      | : (range 0.8...60 m/s)                               |
| wind speed up to 10 m/s       | : ± 0.5 m/s  |
| wind speed over 10 m/s        | : error < 3%   |
| Current Loop output           | : 0 to 20 mA or 4 to 20 mA (jumper selectable)       |
| Operating temp.               | : -40...+55 °C (-40...+131 °F)                       |
| Storage temperature           | : -60...+65 °C (-76...+149 °F)                       |
| Ball bearing                  | : stainless St ball bearing,                         |
| Materials                     | : Polycarbonate/stainless steel (body of anemometer) |
| Cups                          | : polycarbonate                                      |
| Case                          | : polycarbonate case IP66/67                         |
| Case dimension                | : 80*82*56 mm3                                       |
| Dimensions                    | : o170 * 300 mm                                      |
| Operating voltage             | : 20...28 VDC, 5 W,                                  |
| Heating                       | : 3 W beside bearing,                                |
| <br>                          |  |
| Transmitter cable e.g.        | : 2 *2 ' 0,25 mm2,                                   |
| Normal instrumentation cable, | : 2 pair   |
| <br>                          |  |
| OPTIONS:                      |  |
| Current isolation             | : EM-M14, 4-20mA / 4-20mA                            |
| Cabling                       | : Instrumentation cable 2*2*0,25mm2+1                |

Serial No. \_\_\_\_\_ Date of delivery: \_\_\_\_\_

QC: \_\_\_\_\_



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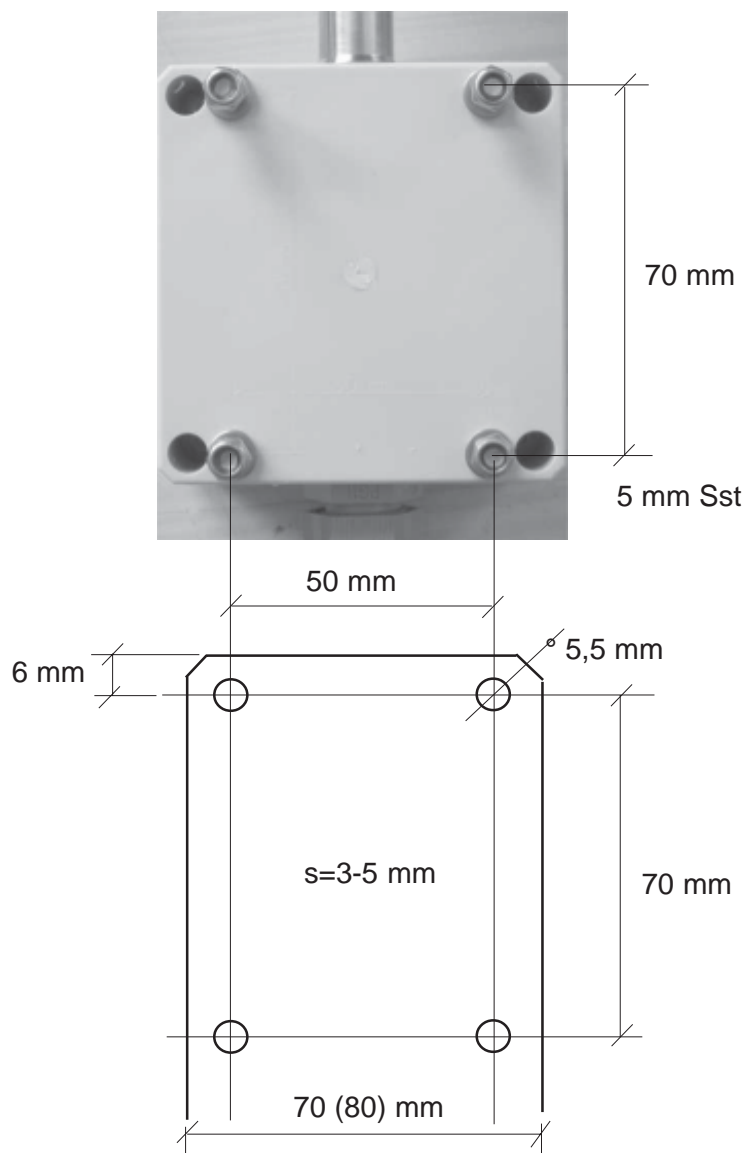
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## Installation



### Installing the transducer to the mast

The transducer is installed to eg. 70 mm plate with the mounting screws in the case. If the mounting place is subject to severe vibration, shock absorbers can be used between the transmitter box and the plate/mast.

It should also be checked that the vibration frequency does not match the resonance frequency of the absorbers. The anemometer is attached to the connector on the top of the box. The tightness of all the connections must be ensured. The sensor heating is activated by a thermostat, when the temperature of the sensors falls below 4 degrees Celsius and deactivated when it rises over +6 C.

The transmitter cable is attached with a spacing small enough by means of clamps or bands.

The lid of the case is opened and the wires are connected to the screws of the terminal.

The lid is closed carefully to ensure the rubberbascet to tighten the case waterproof.

The mast must be protect the transducer from lightning strikes, a thin lightning rod can be mounted near the sensors so that its tip uprises higher than any part of the sensors. To ease the maintenance, the removal of the transducer should be considered already when planning the installation.

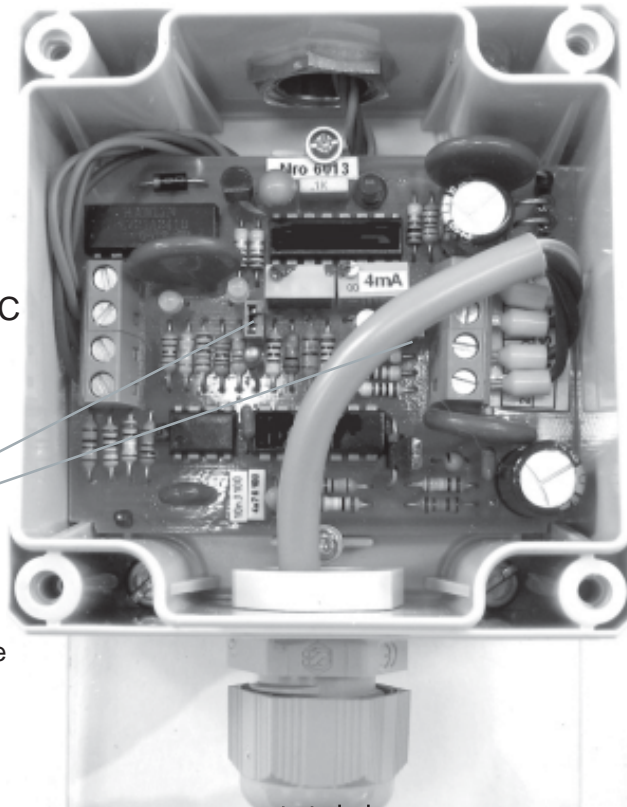
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|---|---|--|--|--|--|

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## Connection

F green Heating -  
E green Heating +24 VDC  
C blue sensor  
B braun 0 V

Jumpers:  
Connected 4 - 20 mA  
Open 0 - 20 mA  
(Both jumpers must be change  
in the same time and position)



4 Current Loop -  
3 Current Loop +  
2 0 V  
1 +24 VDC

1. +24 VDC ○  
2. 0 V ○

3. CL+ 4. CL-



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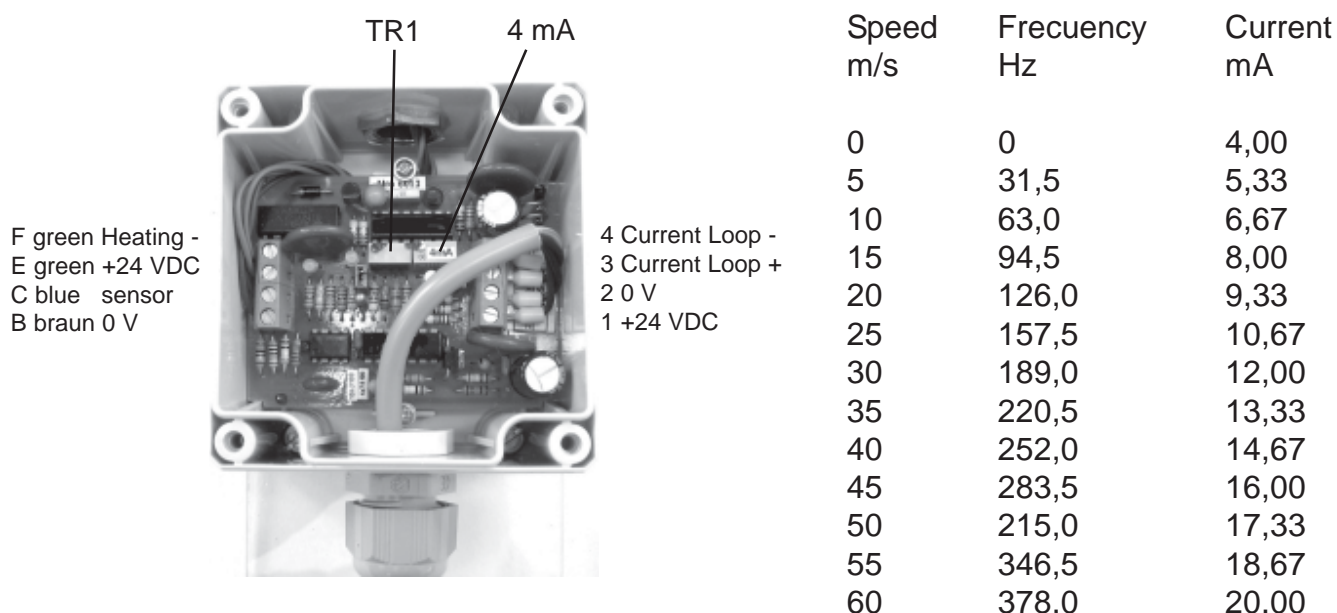
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## SERVICE Calibration Wind Speed / Frequency

Calibration is checked in wind tunnel of Tampere University of Technology, in Tampere, Finland.  
Wind speed m/s versus anemometer frequency (small AC signal 0 to abt. 2-5 Volt pp) :



The calibration check:

First, be sure that bearing is clean and rotate easy (no voice, jerky etc.), otherwise bearing should be change. (See page 6). If bearing is in good condition, but became suspicious of wrong reading, the calibration check of electronic is needed ( In this example 0 to 60 m/s = 4 to 20 mA).

1. Meters: Frequency Generator / Frequency Counter and Current Meter.
2. Connect power supply +24VDC and 0 V to terminal 1 and 2.
3. Connect Current meter to terminal 3 and 4 (current loop + and -),
4. Disconnect sensor leads B and C.
5. Connect Frequency Counter and Frequency Generator (sine, 2 to 5 V) to terminal B and C.
6. The speed 0 m/s, (Frequency Generator 0 Hz) the current is 4,00 mA, if not, set the calibration trimmer (4mA).
7. If it is correct, set the (see the above table) transmitter terminal speed / frequency for example 30 m/s, (Frequency Generator) 189,0 Hz.
8. Check the corresponding current 12,00 mA, if not, set the calibration trimmer TR1 to correct value.
9. Repeat points 6 - 8 for needed frequency.
10. Connect sensor leads back.

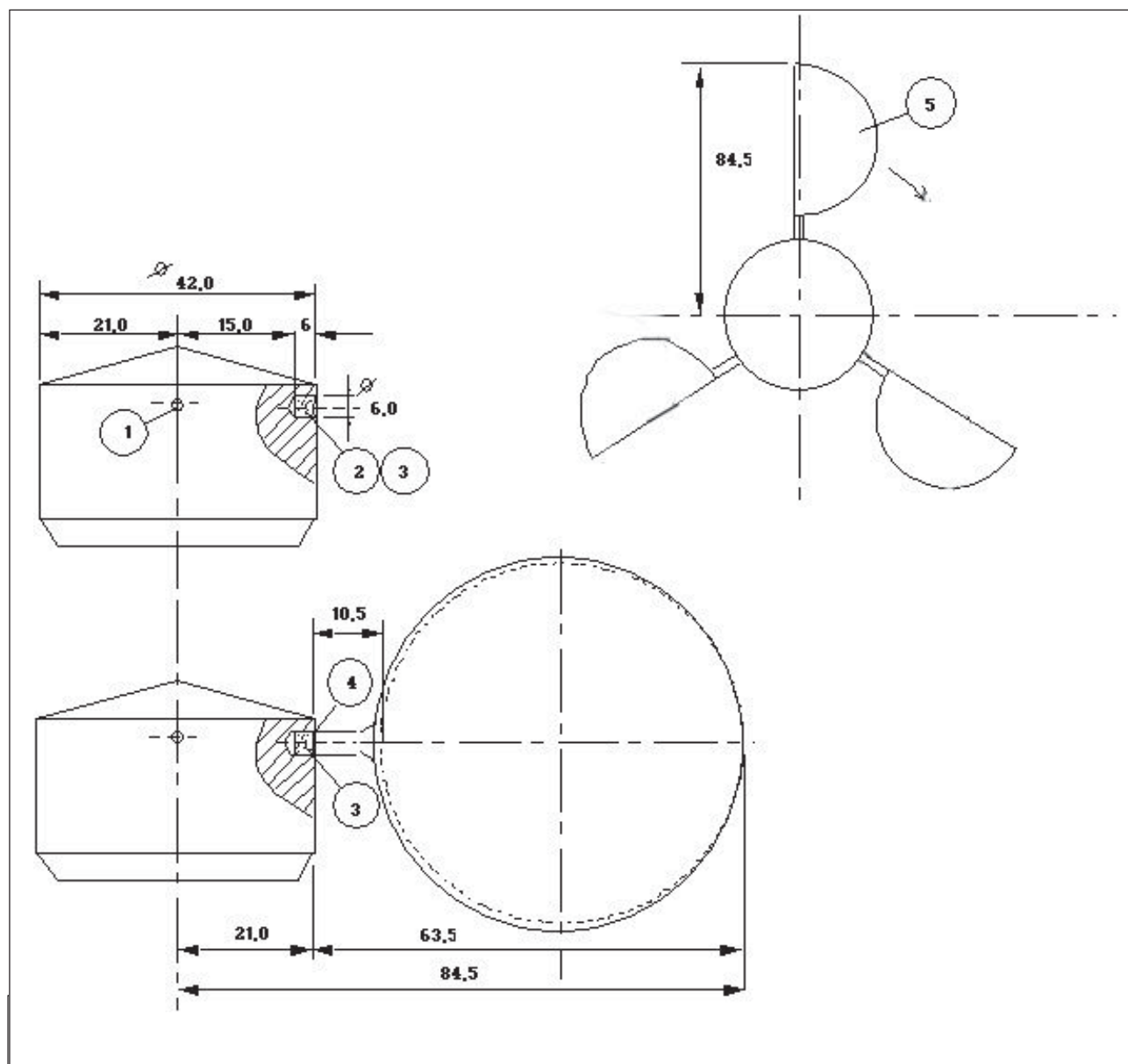


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## Service

### SERVICE INSTRUCTION 2: REPLACING A BROKEN TRANSMITTER CUP

1. Remove the grid of the cups as per instructions on previous page.
2. The shaft of the broken cup is cut off at the root and with a  $\varnothing 6.0$  mm drill in the previous location of the shaft a 6.0 deep hole is drilled perpendicular to the center.
3. To increase adhesion rough on the surface of the hole and the shaft of the new cup.
4. Use ARALDIT RAPID or equivalent (epoxy) glue to bond the cup, remove extra glue from the joint.
5. Check that the cup is correctly placed and perpendicular to the rotating axle. Check the rotating radius to be according to the drawing. This measurement has an effect on the balance and speed of the rotation.
6. Let the bonded joint dry up correctly. ( See the instructions of glue).
7. Install the grid of the cups according to instructions on previous page.



# Wind Anemometer WS-S-CL Marine Model

## How to order

WS can be equipped with several options and measurement scales:

**Transmitter**    **WS-S-CL-MM (anemometer)**

Wind Speed Transmitter, 6 pulse / rev. with heating (24 VDC, 3 W)

**Scales**

|                |  |
|----------------|--|
| -60            | 0 to 60 m/s                            |
| Scale options: |  |
| -30            | 0 to 30 m/s                            |
| -40            | 0 to 40 m/s / 80 knots                 |
| -160 KMPH      | 0 to 160 km/h / 100 mph.               |
| -XX YYY        | 0 to max.value XX of speed quality YYY |

**Special outputs: ( calibrated for specified scales, non isolated )**

|         |  |
|---------|--|
| -420    | Current loop output for meter or logic, standard 4 to 20 mA, factory default |
| -020    | Current loop output for meter or logic, standard 0 to 20 mA,                 |
| -EMM-14 | Current Loop isolator for isolated signal 4 to 20 mA                         |

**Power supply:**

|     |        |
|-----|--------|
| -24 | 24 VDC |
|-----|--------|

**For example:**    **WS-S-CL-MM-60-420-24**

|            |   |
|------------|---|
| Anemometer | WS-S-CL-MM (Weather Station-wind Speed-Current Loop output)               |
| - 60       | calibrated for 60 m/s,  |
| - 420      | Current loop output for meter or logic, standard 4 to 20 mA, non isolated |