## Application note

# Testing the WindSensor P2546A-OPR

The output of the WindSensor P2546A-OPR Cup Anemometer is a switch closure function with the switching frequency proportional to the wind speed. Magnets mounted inside the P2546A-OPR causes an internal switch to open and close when rotating the cup rotor. By measuring the output resistance during rotation, it is possible to test if the internal switch is working properly.

Two different test methods has been specified depending on whether the cup anemometer is accessible and rotated by hand (laboratory test) or the cup anemometer is installed on site and rotated by the wind (site test).

A digital multimeter must be used for measuring the output resistance of the cup anemometer.

**Method 1: Laboratory test with the cup anemometer rotated by hand:**

1. Connect a cable with free ends to the cup anemometer.
2. Set the digital multimeter into resistance mode typically identified by a Ω symbol on the measurement selector.
3. Connect the brown wire from the cup anemometer to the ground terminal on the digital multimeter (typically labeled COM) and the white wire from the cup anemometer to the resistance terminal on the digital multimeter (typically labeled Ω).
4. Slowly rotate the cup rotor and stop when the resistance value changes. Check that the resistance reading on the digital multimeter changes between 330 ± 15 Ω and overload (O.L) for every 90 degrees of rotation or four times during a rotation. Figure 1 and 2 shows the digital multimeter display when the internal switch is closed and open respectively.


**Figure 1**

Digital multimeter showing approx. 330 Ω with the internal switch closed.


**Figure 2**

Digital multimeter showing overload (O.L) with the internal switch open.

**Method 2: Site test with the cup anemometer rotated by the wind:**

1. Disconnect the cup anemometer terminals from the datalogger
2. Set the digital multimeter into resistance mode typically identified by a Ω symbol on the measurement selector.
3. Connect the brown wire from the cup anemometer to the ground terminal on the digital multimeter (typically labeled COM) and the white wire from the cup anemometer to the resistance terminal on the digital multimeter (typically labeled Ω).
4. In low wind speed conditions check that the resistance reading on the digital multimeter is changing between 330 ± 15 Ω and overload (O.L). In higher wind speed conditions check that the resistance reading on the digital multimeter shows an average resistance value in the kΩ or MΩ range depending on the type of digital multimeter used. Figure 3 and 4 shows the digital multimeter display at low and high wind respectively.

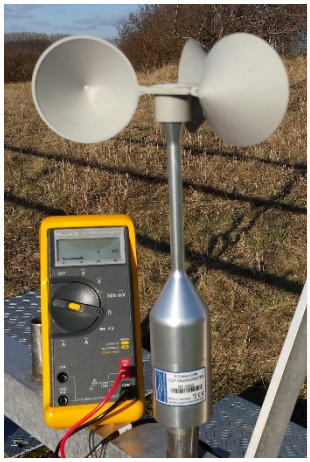

**Figure 3**

In low wind speed conditions, the digital multimeter will change between approx. 330 Ω and overload (O.L). During the shift, the display may be blank as seen on the picture.


**Figure 4**

In higher wind speed conditions, the resistance change will happen more frequently resulting in an average resistance value shown on the digital multimeter, in this case 0.835 MΩ.