



FGW e. V. • Oranienburger Straße 45 • 10117 Berlin • Deutschland

FA LK Statement

FGW e.V.

**Fördergesellschaft Windenergie
und andere Dezentrale Energien**

Oranienburger Straße 45
10117 Berlin

Tel. : +49 (0)30 / 3010 1505 0

info@wind-fgw.de

www.wind-fgw.de

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Classified anemometers in the field of power characteristic measurement

The Technical Committee Power Curve (FA LK) has decided to publish the following statement on the use of anemometers classified according to IEC 61400-12-1:2017 in the field of power curve measurement.

On behalf of Technical Committee Power Curve

Bente Klose

Use of anemometers classified according to IEC 61400-12-1:2017 in the field of power curve measurement

Pressure compensation for anemometers of type Thies First Class Advanced X and II (4.3352.XX.XXX):

According to IEC 61400-12-1:2017, only anemometers with a class number better than 1.7A are permitted (p.30). To ensure this, the Thies First Class Advanced X anemometer (4.3352.XX.4XX) provides integrated compensation for air density dependence within the limits of the standard (0.9 - 1.35 kg/m³).

Thies writes in this regard:

"The rotational speed of the cup is dependent on the air density and thus also on the air pressure. The correction of this dependence takes place in a pressure range from 700hPa to 1100hPa." (Thies021813/12/21 p. 20)

"A high precision digital pressure sensor (piezo-resistive) is used to measure the absolute air pressure. [...] Absolute air pressure is used to apply wind speed compensation by means of air pressure." (Thies021813/12/21 p. 9)

"Compensation as a function of air pressure is performed with the wind speed value determined using the calibration table." (Thies021813/12/21 p. 7) (Translations by the author)

According to IEC/ISO 17025:2017, all measuring equipment must be calibrated. This also applies to the pressure sensor of the anemometer, although the expected influence should be small in most cases.

The values of the pressure sensor can be read out via the digital interface of the Thies X with the help of the measured value telegram 2 (Thies021813/12/21 p. 72) and therefore a calibration of the pressure sensor should be possible.

However, since the pressure compensation is carried out directly in the anemometer, it can be spoken of a black box in case of doubt. In order to prevent this and to be independent of the pressure sensor of the anemometer, the Technical Committee Power Curve is of the opinion that a pressure compensation with external air pressure sensors is possible after the data recording and thus the same class number can be assumed as with switched on pressure compensation.

Since the Thies First Class Advanced II is identical in construction to the X, only without a microprocessor, the same class number can be achieved here with downstream pressure compensation.

However, the pressure correction table stored in the Thies First Class Advanced X (4.3352.XX.4XX) and its application description are required for this!

Downward compatibility with anemometers of the type Thies First Class Advanced X and II (4.3352.XX.XXX):

When measuring the power curve according to IEC 61400-12-1, anemometers classified according to the respective standard edition are required. This means that anemometers classified according to IEC 61400-12-1:2017 cannot be used for measurements according to IEC 61400-12-1:2005 to determine the wind speed.

However, since the requirements of the two editions of the standard do not differ and the technical investigations were even more extensive when classifying the anemometer types Thies First Class Advanced X and II (4.3352.XX.XXX) according to IEC 61400-12-1:2017, the Technical Committee Power Curve is of the opinion that it is possible to use these types according to IEC 61400-12-1:2005.

This statement refers exclusively to the above case and not to the application of anemometer classification according to IEC 61400-12-1:2005 when IEC 61400-12-1:2017 is applied.