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# **RenewableUK**

## **Small Wind Turbine Standard**

**15 January 2014**

Formerly known as:

British Wind Energy Association

Small Wind Turbine Performance and Safety Standard

## Foreword

This edition cancels and replaces the edition published on 01 October 2013. This edition is a minor revision primarily arising from publication of IEC 61400-2 edition 3.

## 1 General Information

### 1.1 Purpose

This standard was created by the small wind turbine industry, scientists, state officials and consumers to provide consumers with realistic and comparable performance ratings and an assurance the small wind turbine products certified to this standard have been engineered to meet carefully considered standards for safety and operation. The goal of the standard is to provide consumers with a measure of confidence in the quality of small wind turbine products meeting this standard and an improved basis for comparing the performance of competing products.

### 1.2 Overview

This standard provides a method for evaluation of wind turbine systems in terms of safety, reliability, power performance and acoustic characteristics. This standard for small wind turbines is derived largely from existing international wind turbine standards developed under the auspices of the International Electrotechnical Commission (IEC).

No indirect or secondary standard references are intended. Only standards directly referenced in this standard are embodied. The use of the corresponding British Standards Institute (BSI) versions of the suite of IEC 61400 standards is acceptable.

### 1.3 Scope

This standard applies to small wind turbine systems as defined in IEC 61400-2: ed3.0 (2013-12).

### 1.4 Compliance

Compliance with this standard must be certified by a certification body itself accredited to the requirements of ISO Guide 65 or EN 45011 or ISO/IEC 17065 by UKAS or an equivalent accreditation body (for example, a member of EA: European co-operation for Accreditation).

Test data may be taken, analyses may be performed, and test reports may be submitted by any party, including the manufacturer, but they must be provided in a manner acceptable to an accredited certifying body<sup>1</sup>.

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<sup>1</sup> Unless conducted by a test laboratory itself accredited to the requirements of ISO 17025 or ISO/IEC 17065 by UKAS or an equivalent accreditation body. This will normally require that the certification authority be involved well before the commencement of data gathering, and the certification authority are likely to require intense scrutiny of the entire process.

## 1.5 Definitions

1.5.1 Per IEC 61400-12-1: ed1.0 (2005-12) (Performance); IEC 61400-11:ed3.0 (2012-11) (Acoustic Noise); IEC TS 61400-14: ed1.0 (2005-03) (Sound Power Declaration); and IEC 61400-2: ed3.0 (2013-12) (Small Wind Turbines).

1.5.2 Additional Definitions (for reporting purposes)

1.5.2.1 Maximum Power: The maximum output power (being the one-minute definition,  $P_{60}$ ) as defined in IEC 61400-2 ed 3.

1.5.2.2 Maximum Voltage: The maximum output voltage (being the one-minute definition,  $U_{60}$ ) as defined in IEC 61400-2 ed 3.

1.5.2.3 Maximum Current: The maximum output current (being the one-minute definition,  $i_{60}$ ) as defined in IEC 61400-2 ed 3.

## 2 Acoustic Noise Measurement

The wind turbine system acoustic noise performance shall be tested and documented in a test report per IEC 61400-11:ed3.0 (2012-11) and IEC TS 61400-14: ed1.0, incorporating relevant additional guidance provided in IEC 61400-2: ed3.0 (2013-12).

## 3 Power Performance Testing

The wind turbine system power performance shall be tested and documented in a test report per IEC 61400-12-1: ed1.0 (2005-12), incorporating relevant additional guidance provided in IEC 61400-2: ed3.0 (2013-12).

## 4 Compliance with IEC 61400-2 Small Wind Turbines

The wind turbine system shall comply with the following sections of IEC 61400-2: ed3.0 (2013-12):

Section 1 (Scope)

Section 2 (Normative References)

Section 3 (Definitions)

Section 4 (Symbols and Abbreviated Terms)

Section 5 (Principal Elements)

Section 6 (External Conditions)

Section 7 (Structural Design)

Section 8 (Protection and Shutdown System)

Section 10 (Support Structure)

Section 11 (Documentation Requirements)

Section 12 (Wind Turbine Markings)

Section 13 (Testing), excepting Section 13.8 (Electrical)

NOTE - In accordance with Section 1 of IEC 61400-2: ed3.0 (2013-12), “Any of the requirements of this standard may be altered if it can be suitably demonstrated that the safety of the turbine system is not compromised.”

NOTE - Section 9 (Electrical) is not mandatory.

## **5 Reporting**

The manufacturers of certified wind turbines shall comply with Sections 11 and 12 of IEC 61400-2: ed3.0 (2013-12), and the Consumer Label with the corresponding Test Summary Report shall be provided as per Annex M.

The Consumer Label and the corresponding Test Summary Report is to be made continuously and publically available, in the English language as a minimum, on the manufacturer’s web site.

The use of more detailed performance characterisations, such as power curves or estimated energy output graphs or tables, is allowed so long as this material was included in the certification.

## **6 Certification**

For each wind turbine system to be certified, the manufacturer shall submit to an accredited certifying body for review and certification of the following information:

- Report in accordance with IEC 61400-11 (acoustic noise measurement).
- Report in accordance with IEC 61400-12-1 (power performance testing).
- Report in accordance with IEC 61400-2 ed3 (small wind turbines) including the requirements of sections 11 and 12, and the Consumer Label per Annex M together with the corresponding Test Summary Report.
- Any additional supporting information that the manufacturer deems appropriate.

## **7 Variants and Modifications, including to Certified Products**

Modifications to a turbine system might be for the purpose of creating variants of the original turbine system, or for the purpose of improving the original turbine system. In principle, modifications include any aspect of the turbine system. In all cases, Annex A of IEC 61400-2: ed3.0 (2013-12) shall be complied with as if it were a normative Annex.

## **8 Ongoing Obligations**

During and after turbine certification, the manufacturer is required to notify the accredited certifying body of all significant changes to the product, including hardware and software. The accredited certifying body will determine whether there is a need for retesting and/or additional review.

This requirement to notify the certifying body is intended to be interpreted broadly and in a co-operative manner by both manufacturer and certification body such that any relevant information regarding the in-service performance of the wind turbine system and any of its

variants is analysed and the design, manufacture, installation, operation, or maintenance varied accordingly in accordance with the underlying purpose of this standard. This requirement includes significant incidents or failures of which the manufacturer is aware.

This requirement is to be fulfilled in a timely manner and to include all credible sources of information. Procedures can be agreed between the certification body and the manufacturer such that information is managed in a proportionate manner.

## 9 References

### 9.1 Normative References

IEC 61400-2: ed3.0 (2013-12), Small wind turbines.

IEC 61400-11:ed3.0 (2012-11), Wind turbine generator systems: Acoustic noise measurement techniques.

IEC 61400-12-1: ed1.0 (2005-12), Wind turbines: Power performance measurement of grid connected wind turbines.

IEC TS 61400-14: ed1.0 (2005-03) Wind turbines – Part 14: Declaration of apparent sound power level and tonality values.

Technical note to facilitate wind turbine inverter change and modification for MCS, RenewableUK, April 2011.

## 10 Revision history

Document date	Details
29 February 2008	Initial substantive edition, issued by BWEA (now RenewableUK)
01 October 2013	Substantial revision arising from prepublication of IEC 61400-2 edition 3 as an 'FDIS'
15 January 2014	Minor revision arising from publication of IEC 61400-2 edition 3 with known errata corrected.