IEC 61400-50-2

Edition 1.0 2022-08

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Wind energy generation systems – Part 50-2: Wind measurement – Application of ground-mounted remote sensing technology

Systèmes de génération d'énergie éolienne – Partie 50-2: Mesurage du vent – Application de la technologie de télédétection montée au sol

IEC 61400-50-2:2022 (en-fr)

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FOREWORD

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IEC 61400-50-2 has been prepared by IEC technical committee 88: Wind energy generation systems. It is an International Standard.

This first edition of IEC 61400-50-2 is part of a structural revision that cancels and replaces the performance standards IEC 61400-12-1:2017 and IEC 61400-12-2:2013. The structural revision contains no technical changes with respect to IEC 61400-12-1:2017 and IEC 61400-12-2:2013, but the parts that relate to wind measurements, measurement of site calibration and assessment of obstacle and terrain have been extracted into separate standards.

The purpose of the re-structure was to allow the future management and revision of the power performance standards to be carried out more efficiently in terms of time and cost and to provide a more logical division of the wind measurement requirements into a series of separate standards which could be referred to by other use case standards in the IEC 61400 series and subsequently maintained and developed by appropriate experts.

The text of this International Standard is based on the following documents:

Draft	Report on voting
88/829/CDV	88/865/RVC

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 61400 series, published under the general title *Wind energy generation systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 61400 specifies procedures and methods which ensure that wind measurements using ground-mounted remote sensing devices are carried out and reported consistently and in accordance with best practice. This document does not define the purpose or use case of the wind measurements. However, as this document forms part of the IEC 61400 series of standards, it is anticipated that the wind measurements will be used in relation to some form of wind energy testing or resource assessment.

The main clauses of this document are not mutually dependent. Therefore, it is possible that a user will refer to only certain of the main clauses rather than all clauses to adapt this document to their specific use case. However, the main clauses are presented in a logical sequence that could be applied in practice.

The technical content of this document could previously be found in IEC 61400-12-1:2017 [1][1]. Because of the increasing complexity of this source document, IEC TC 88 decided that a re-structuring of the IEC 61400-12 series of standards into a number of more specific parts would allow more efficient management and maintenance going forward. This document has been created as part of that re-structuring process.

[1] Numbers in square brackets refer to the Bibliography.

WIND ENERGY GENERATION SYSTEMS –

Part 50-2: Wind measurement – Application of ground-mounted remote sensing technology

1 Scope

IEC 61400-50 specifies methods and requirements for the application of instruments to measure wind speed (and related parameters, e.g. wind direction and turbulence intensity). Such measurements are required as an input to some of the evaluation and testing procedures for wind energy and wind turbine technology (e.g. resource evaluation and turbine testing) described by other standards in the IEC 61400 series. This document is applicable specifically to the use of ground-mounted remote sensing wind measurement instruments, i.e. devices which measure the wind at some location generally above and distant from the location at which the instrument is mounted (e.g. sodars, vertical profiling lidars). This document specifically excludes other types of RSD such as forward facing or scanning lidars. This document specifies the following:

a) the procedure and requirements for classifying ground-based RSDs in order to assess the uncertainty pertaining from sensitivity of the RSD response to meteorological conditions that can vary between the RSD calibration place and time and the use case (specific measurement campaign – SMC) place and time;

b) the procedures and requirements for calibration of RSDs;

c) the assessment of wind speed measurement uncertainty;

d) additional checks of the RSD performance and measurement uncertainty during the SMC;

e) application of the wind speed uncertainty derived from the RSD calibration and classification to the measurements taken during the SMC (e.g. interpolation of uncertainty or calibration results to different heights);

f) requirements for reporting.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61400-50-1, *Wind energy generation systems – Part 50-1: Wind measurement – Application of meteorological mast, nacelle and spinner mounted instruments*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp