



SLOVENSKI STANDARD
SIST EN 61400-11:2013/A1:2018
01-oktober-2018

**Sistemi za proizvodnjo energije na veter - 11. del: Tehnike merjenja hrupa -
Dopolnilo A1 (IEC 61400-11:2012/A1:2018)**

Wind energy generation systems - Part 11: Acoustic noise measurement techniques
(IEC 61400-11:2012/A1:2018)

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ICS:

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
27.180	Vetrne elektrarne	Wind turbine energy systems

SIST EN 61400-11:2013/A1:2018 **en**

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61400-11:2013/A1

August 2018

ICS 27.180

English Version

**Wind turbines - Part 11: Acoustic noise measurement techniques
(IEC 61400-11:2012/A1:2018)**

Eoliennes - Partie 11: Techniques de mesure du bruit
acoustique
(IEC 61400-11:2012/A1:2018)

Windenergieanlagen - Teil 11: Schallmessverfahren
(IEC 61400-11:2012/A1:2018)

This amendment A1 modifies the European Standard EN 61400-11:2013; it was approved by CENELEC on 2018-07-20. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 61400-11:2013/A1:2018 (E)**European foreword**

The text of document 88/615/CDV, future edition 1 of IEC 61400-11:2012/A1, prepared by IEC/TC 88 "Wind energy generation systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61400-11:2013/A1:2018.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-04-20
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2021-07-20

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Endorsement notice

The text of the International Standard IEC 61400-11:2012/A1:2018 was approved by CENELEC as a European Standard without any modification.

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NORME INTERNATIONALE



AMENDMENT 1
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Wind turbines – iTeh STANDARD PREVIEW
Part 11: Acoustic noise measurement techniques
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Éoliennes –
Partie 11: Techniques de mesure du bruit acoustique
SIST EN 61400-11:2013/A1:2018
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FOREWORD

This amendment has been prepared IEC technical committee 88: Wind energy generation systems.

The text of this amendment is based on the following documents:

CDV	Report on voting
88/615/CDV	88/644A/RVC

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

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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 to the Amendment

This amendment to IEC 61400-11:2012 addresses the situation where a measurement consists of measurements series on different days or with substantially different conditions. Furthermore, clarifications have been introduced on tonality analysis and reporting. Editorial changes have been made.

6 Instrumentation**6.1.2 Equipment for the determination of the equivalent continuous A-weighted sound pressure level**

Add "relevant to this document" after "requirements".

6.1.3 Equipment for the determination of A-weighted 1/3-octave band spectra

Add, in the second sentence, "relevant to this document" after "requirements".

7 Acoustic measurements and measurement procedures

7.1 Acoustic measurement positions

Add, at the end of the second paragraph after 2 %, the following new text:

The measurement distance shall be as close as possible to R_0 . The allowed tolerance should only be used where it is essential to obtain valid data and, where this is done, clear evidence shall be reported to justify the decision made.

7.2.2 Acoustic measurement requirements

Add "(see 7.2.8)" at the end of 6th bullet of the first paragraph.

Add the following new subclause after 7.2.7:

7.2.8 Combining measurement series

When there are data available from different measurement series with differing environmental conditions, then the data can only be combined using expert judgement. This may involve pooling all the available data and analysing collectively, or it may involve analysing the periods separately and combining the results. In the latter case, when there are overlapping results then the method of weighted means, defined in Annex H, shall be used to combine these into a single result.

The tonal analysis should always be based on pooling all the available data.

Where this is done, clear evidence shall be provided to justify the decisions made. This may, for example, be accomplished by showing a scatter plot of the raw data colour coded for the measurement series.

8 Non-acoustic measurements

8.2.1.1 Determination of wind speed through power curve

Add, in third sentence of the first paragraph, "closed" before the term "intervals" to read "closed intervals".

Add, at the end of the first paragraph, the following new text:

Within the allowed range of the power curve, piece-wise linear interpolation shall be used to define a continuous function between interval supporting points.

8.2.2 Wind speed measurements during background noise measurements

Replace, in the second paragraph, " κ_z " by " κ_Z ".

9 Data reduction procedures

9.2.4 Calculation of noise levels at bin centres including uncertainty

Replace Equation (20) by the following new equation:

$$L_{V,i}(t) = (1-t) \cdot \bar{L}_{i,k} + t \cdot \bar{L}_{i,k+1} \quad (20)$$

Replace Equation (22) by the following new equation:

$$u_{LV,i}(t) = \sqrt{u_{L,i}^2(t) - \frac{\text{COV}_{LV,i}^2(t)}{u_{\bar{V}}^2(t)}} \quad (22)$$

where

$$u_{L,i}^2(t) = (1-t)^2 \cdot u_{\text{com},L,i,k}^2 + t^2 \cdot u_{\text{com},L,i,k+1}^2$$

$$\text{COV}_{LV,i}(t) = (1-t)^2 \cdot \frac{\text{COV}_{LV,i,k}}{N_k} + t^2 \cdot \frac{\text{COV}_{LV,i,k+1}}{N_{k+1}}$$

$$u_{\bar{V}}^2(t) = (1-t)^2 \cdot u_{\text{com},V,k}^2 + t^2 \cdot u_{\text{com},V,k+1}^2$$

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Replace Figure 7 by the following:

