BSI Standards Publication

Wind energy generation systems

Part 24: Lightning protection

bsi.

National foreword

This British Standard is the UK implementation of EN IEC 61400-24:2019. It is identical to IEC 61400-24:2019. It supersedes BS EN 61400-24:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PEL/88, Wind turbines.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD **EN IEC 61400-24**

EUROPÄISCHE NORM

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Supersedes EN 61400-24:2010 and all of its amendments and corrigenda (if any)

English Version

Wind energy generation systems - Part 24: Lightning protection (IEC 61400-24:2019)

Systèmes de génération d'énergie éolienne - Partie 24 : Protection contre la foudre (IEC 61400-24:2019)

Windenergieanlagen - Teil 24: Blitzschutz (IEC 61400-24:2019)

This European Standard was approved by CENELEC on 2019-08-07. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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

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European foreword

The text of document 88/709/FDIS, future edition 2 of IEC 61400-24, prepared by IEC/TC 88 "Wind energy generation systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61400-24:2019.

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) 2020-05-07
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-08-07

This document supersedes EN 61400-24:2010 and all of its amendments and corrigenda (if any).

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Endorsement notice

The text of the International Standard IEC 61400-24:2019 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60060-1:2010	NOTE	Harmonized as EN 60060-1:2010 (not modified)
IEC 60071 (series)	NOTE	Harmonized as EN 60071 (series)
IEC 60071-2:2018	NOTE	Harmonized as EN IEC 60071-2:2018 (not modified)
IEC 60099-4	NOTE	Harmonized as EN 60099-4
IEC 60099-5	NOTE	Harmonized as EN IEC 60099-5
IEC 60204-1	NOTE	Harmonized as EN 60204-1
IEC 60204-11	NOTE	Harmonized as EN IEC 60204-11
IEC 60243 (series)	NOTE	Harmonized as EN 60243 (series)
IEC 60243-1	NOTE	Harmonized as EN 60243-1
IEC 60243-3	NOTE	Harmonized as EN 60243-3
IEC 60464-2	NOTE	Harmonized as EN 60464-2
IEC 60587	NOTE	Harmonized as EN 60587
IEC 62561 (series)	NOTE	Harmonized as EN IEC 62561 (series)
IEC 62561-1	NOTE	Harmonized as EN 62561-1
IEC 62793	NOTE	Harmonized as EN IEC 62793
IEC 62858	NOTE	Harmonized as EN 62858

(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60364-4-44	-	Low-voltage electrical installations - Part 44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-442	-
IEC 60364-5-53	-	Low-voltage electrical installations -- Part-5-53: Selection and erection of electrical equipment - Protection, isolation, switching, control and monitoring		-
IEC 60364-5-54	-	Low-voltage electrical installations - Part 54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	-
IEC 60364-6	-	Low voltage electrical installations - Part 6: Verification	HD 60364-6	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	-
IEC 61000-1	series	Electromagnetic compatibility (EMC) - Part 1-2: General - Methodology for the achievement of functional safety of electrical and electronic systems including equipment with regard to electromagnetic phenomena	EN 61000-1	series
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	-
IEC 61000-4-9	-	Electromagnetic compatibility (EMC) – Part 4-9: Testing and measurement techniques – Impulse magnetic field immunity test	EN 61000-4-9	-
IEC 61000-4-10	-	Electromagnetic compatibility (EMC) – Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test	EN 61000-4-10	-

IEC 61400-23	-	Wind turbines - Part 23: Full-scale structural testing of rotor blades	EN 61400-23	-
IEC 61587-3	-	Mechanical structures for electronic equipment - Tests for IEC 60917 and IEC 60297 - Part 3: Electromagnetic shielding performance tests for cabinets and subracks	EN 61587-3	-
IEC 61643-11	-	Low-voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	EN 61643-11	-
IEC 61643-12	-	Low-voltage surge protective devices - Part 12: Surge protective devices connected to low-voltage power distribution systems - Selection and application principles	CLC/TS 61643-12	-
IEC 61643-21	-	Low voltage surge protective devices - Part-21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods		-
IEC 61643-22	-	Low-voltage surge protective devices - Part 22: Surge protective devices connected to telecommunications and signalling networks - Selection and application principles	CLC/TS 61643-22	-
IEC 61936-1	-	Power installations exceeding 1 kV a.c. -Part 1: Common rules	EN 61936-1	-
IEC 62305-1 (mod)	2010	Protection against lightning - Part 1:General principles	EN 62305-1	2011
IEC 62305-2 (mod)	2010	Protection against lightning - Part 2: Risk management	EN 62305-2	2012
IEC 62305-3 (mod)	2010	Protection against lightning - Part 3:Physical damage to structures and life hazard	EN 62305-3	2011
IEC 62305-4 (mod)	2010	Protection against lightning - Part 4:Electrical and electronic systems within structures	EN 62305-4	2011
IEC/TR 60479-4	-	Effects of current on human beings and-livestock -- Part 4: Effects of lightning strokes on human beings and livestock		-
IEC/TR 61000-5-2	-	Electromagnetic compatibility (EMC) - Part-5: Installation and mitigation guidelines - Section 2: Earthing and cabling		-
IEC/TS 60479-1	-	Effects of current on human beings and-livestock - Part 1: General aspects		-
IEC/TS 61936-2	-	Power installations exceeding 1 kV a.c.-and 1,5 kV d.c. - Part 2: d.c.		-
ITU-T K.20	-	Resistibility of telecommunication-equipment installed in a telecommunication centre to overvoltages and overcurrents		-

ITU-T K.21	-	Resistibility of telecommunication-equipment installed in customer premises to overvoltages and overcurrents		-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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WIND ENERGY GENERATION SYSTEMS –

Part 24: Lightning protection

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61400-24 has been prepared by IEC technical committee 88: Wind energy generation systems.

This second edition cancels and replaces the first edition, published in 2010. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) it is restructured with a main normative part, while informative information is placed in annexes.

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

FDIS	Report on voting
88/709/FDIS	88/713/RVD

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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 "http://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.

A bilingual version of this publication may be issued at a later date.

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.

WIND ENERGY GENERATION SYSTEMS –

Part 24: Lightning protection

1 Scope

This part of IEC 61400 applies to lightning protection of wind turbine generators and wind power systems. Refer to Annex M guidelines for small wind turbines.

This document defines the lightning environment for wind turbines and risk assessment for wind turbines in that environment. It defines requirements for protection of blades, other structural components and electrical and control systems against both direct and indirect effects of lightning. Test methods to validate compliance are included.

Guidance on the use of applicable lightning protection, industrial electrical and EMC standards including earthing is provided.

Guidance regarding personal safety is provided.

Guidelines for damage statistics and reporting are provided.

Normative references are made to generic standards for lightning protection, low-voltage systems and high-voltage systems for machinery and installations and electromagnetic compatibility (EMC).

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 60364-4-44, *Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances*

IEC 60364-5-53, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*

IEC 60364-5-54, *Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements and protective conductors*

IEC 60364-6, *Low-voltage electrical installations – Part 6: Verification*

IEC TS 60479-1, *Effects of current on human beings and livestock – Part 1: General aspects*

IEC TR 60479-4, *Effects of current on human beings and livestock – Part 4: Effects of lightning strokes*

IEC 60664-1, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 61000 (all parts), *Electromagnetic compatibility (EMC)*