

INTERNATIONAL STANDARD



**Wind energy generation systems –
Part 24: Lightning protection**



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WIND ENERGY GENERATION SYSTEMS –**Part 24: Lightning protection****FOREWORD**

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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.

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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- withdrawn,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
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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)*

IEC 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-9, *Electromagnetic compatibility (EMC) – Part 4-9: Testing and measurement techniques – Impulse magnetic field immunity test*

IEC 61000-4-10, *Electromagnetic compatibility (EMC) – Part 4-10: Testing and measurement techniques – Damped oscillatory magnetic field immunity test*

IEC TR 61000-5-2, *Electromagnetic compatibility (EMC) – Part 5: Installation and mitigation guidelines – Section 2: Earthing and cabling*

IEC 61400-23, *Wind turbine generator systems – Part 23: Full-scale structural testing of rotor blades*

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*

IEC 61643-11, *Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power distribution systems – Requirements and test methods*

IEC 61643-12, *Low-voltage surge protective devices – Part 12: Surge protective devices connected to low-voltage power distribution systems – Selection and application principles*

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*

IEC 61936-1, *Power installations exceeding 1 kV a.c. – Part 1: Common rules*

IEC TS 61936-2, *Power installations exceeding 1 kV a.c. and 1,5 kV d.c. – Part 2: d.c.*

IEC 62305-1:2010, *Protection against lightning – Part 1: General principles*

IEC 62305-2:2010, *Protection against lightning – Part 2: Risk management*

IEC 62305-3:2010, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

IEC 62305-4:2010, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

ITU-T K.20, *Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents*

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