SVENSK STANDARD SS-EN 61400-24

Fastställd	Utgåva	Sida	Ansvarig kommitté
2010-09-27	1	1 (1+155)	SEK TK 88

Vindkraftverk – Del 24: Åskskydd

Wind turbines – Part 24: Lightning protection

Som svensk standard gäller europastandarden EN 61400-24:2010. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61400-24:2010.

Nationellt förord

Europastandarden EN 61400-24:2010

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61400-24, First edition, 2010 - Wind turbines - Part 24: Lightning protection**

utarbetad inom International Electrotechnical Commission, IEC.

ICS 27.180

Denna standard är fastställd av SEK Svensk Elstandard,
som också kan lämna upplysningar om **sakinnehållet** i standarden.
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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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Stora delar av arbetet sker internationellt

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Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61400-24

July 2010

ICS 27.180

English version

Wind turbines - Part 24: Lightning protection

(IEC 61400-24:2010)

Eoliennes - Partie 24: Protection contre la foudre (CEI 61400-24:2010)

Windenergieanlagen - Teil 24: Blitzschutz (IEC 61400-24:2010)

CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Ref. No. EN 61400-24:2010 E

SEK Svensk Elstandard

Foreword

The text of document 88/366/FDIS, future edition 1 of IEC 61400-24, prepared by IEC TC 88, Wind turbines, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61400-24 on 2010-07-01.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN and CENELEC shall not be held responsible for identifying any or all such patent rights.

The following dates were fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2011-04-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2013-07-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61400-24:2010 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
-	-	Power installations exceeding 1 kV a.c.	HD 637 S1 + corr. June	1999 2005
-	-	Lightning Protection Components (LPC) - Part 1: Requirements for connection components	EN 50164-1	-
IEC 60060-1	1989	High-voltage test techniques - Part 1: General definitions and test requirements	HD 588.1 S1	1991
IEC 60068	Series	Environmental testing	EN 60068	Series
IEC 60071	Series	Insulation co-ordination	EN 60071	Series
IEC 60071-2	1996	Insulation co-ordination - Part 2: Application guide	EN 60071-2	1997
IEC 60099-4	-	Surge arresters - Part 4: Metal-oxide surge arresters without gaps for a.c. systems	EN 60099-4	-
IEC 60099-5	-	Surge arresters - Part 5: Selection and application recommendations	EN 60099-5	-
IEC 60204-1	-	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	EN 60204-1	-
IEC 60204-11	-	Safety of machinery - Electrical equipment of machines - Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c. and not exceeding 36 kV	EN 60204-11	-
IEC 60243-1	-	Electrical strength of insulating materials - Test methods - Part 1: Tests at power frequencies	EN 60243-1	-
IEC 60243-3	-	Electrical strength of insulating materials - Test methods - Part 3: Additional requirements for 1,2/50 µs impulse tests	EN 60243-3	-
IEC 60364-4-44	-	Low voltage electrical installations - Part 4-44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	HD 60364-4-444	-

Publication	Year	Title	EN/HD	Year
IEC 60364-5-53 + A1 (mod)	2001 2002	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control	-	-
IEC 60464-2	-	Varnishes used for electrical insulation - Part 2: Methods of test	EN 60464-2	-
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 on human beings and livestock	-	-
IEC 60587	-	Electrical insulating materials used under severe ambient conditions - Test methods for evaluating resistance to tracking and erosion	EN 60587	-
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	-
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	-
IEC/TR 61000-5-2	-	Electromagnetic compatibility (EMC) - Part 5: Installation and mitigation guidelines - Section 2: Earthing and cabling	-	-
IEC/TS 61400-23	-	Wind turbine generator systems - Part 23: Full-scale structural testing of rotor blades	-	-
IEC 61643-1	-	Low-voltage surge protective devices - Part 1: Surge protective devices connected to low-voltage power distribution systems - Requirements and tests	-	-
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	EN 61643-21	-
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 62153-4-3	-	Metallic communication cable test methods - Part 4-3: Electromagnetic Compatibility (EMC) - Surface transfer impedance - Triaxial method	-	-
IEC 62305-1	2006	Protection against lightning - Part 1: General principles	EN 62305-1 + corr. November	2006 2006
IEC 62305-2	2006	Protection against lightning - Part 2: Risk management	EN 62305-2 + corr. November	2006 2006

Publication	Year	Title	EN/HD	Year
IEC 62305-3 (mod) -	2006 -	Protection against lightning - Part 3: Physical damage to structures and life hazard	EN 62305-3 + corr. September + corr. November + A11	2006 2008 2006 2009
IEC 62305-4	2006	Protection against lightning - Part 4: Electrical and electronic systems within structures	EN 62305-4 + corr. November	2006 2006
ITU-T Recommendation K.20	-	Resistibility of telecommunication equipment installed in a telecommunications centre to overvoltages and overcurrents	-	-
ITU-T Recommendation K.21	-	Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents	-	-
ITU-T Recommendation K46	-	Protection of telecommunication lines using metallic symmetric conductors against lightning-induced surges	-	-

CONTENTS

WIND TURBINES –

Part 24: Lightning protection

1 Scope

This International Standard applies to lightning protection of wind turbine generators and wind power systems.

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).

This standard defines the lightning environment for wind turbines and application of the environment for risk assessment for the wind turbine. 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 recommended.

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.

2 Normative references

The following referenced documents are indispensable for the application 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 60060-1:1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60068 (all parts), *Environmental testing*

IEC 60071 (all parts), *Insulation Co-ordination*

IEC 60071-2:1996, *Insulation Co-ordination – Part 2: Application guide*

IEC 60099-4, *Surge arresters – Part 4: Metal-oxide surge arresters without gaps for a.c. systems*

IEC 60099-5, *Surge arresters – Part 5: Selection and application recommendations*

IEC 60204-1, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*

IEC 60204-11, *Safety of machinery – Electrical equipment of machines – Part 11: Requirements for HV equipment for voltages above 1 000 V a.c. or 1 500 V d.c. and not exceeding 36 kV*

IEC 60243-1, *Electrical strength of insulating materials – Test methods – Part 1: Tests at power frequencies*

IEC 60243-3, *Electric strength of solid insulating materials – Test methods – Part 3: Additional requirements for 1,2/50μs impulse tests*

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

IEC 60364-5-53:2001, *Electrical installations of buildings – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control*
Amendment 1(2002)[1)]

IEC 60464-2, *Varnishes used for electrical insulation – Part 2: Methods of test*

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

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

IEC 60587, *Electrical insulating materials used under severe ambient conditions – Test methods for evaluating resistance to tracking and erosion*

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

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

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

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

IEC 61643-1, *Low-voltage surge protective devices – Part 1: Surge protective devices connected to low-voltage power distribution systems – Requirements and tests*

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 62153-4-3, *Metallic communication cable test methods – Part 4-3: Electromagnetic compatibility (EMC) – Surface transfer impedance – Triaxial method*

IEC 62305-1:2006, *Protection against lightning – Part 1: General principles*

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1) There exists a consolidated edition 3.1 (2002) that comprises IEC 60364-5-53 (2001) ant its Amendment 1 (2002).

IEC 62305-2:2006, *Protection against lightning – Part 2: Risk management*

IEC 62305-3:2006, *Protection against lightning – Part 3: Physical damage to structures and life hazard*

IEC 62305-4:2006, *Protection against lightning – Part 4: Electrical and electronic systems within structures*

EN 50164-1, *Lightning Protection Components (LPC) – Part 1: Requirements for connection components*

CLC HD 637 S1, *Power installations exceeding 1kV A.C.*

ITU-T K.2, *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*

ITU-T K.46, *Protection of telecommunication lines using metallic symmetric conductors against lightning-induced surges*