SVENSK STANDARD SS-EN 61558-2-16

Fastställd	Utgåva	Sida	Ansvarig kommitté
2010-02-22	1	1 (1+35)	SEK TK 96

Transformatorer, strömförsörjningsdon och liknande – Säkerhet – Del 2-16: Särskilda fordringar på switchade strömförsörjningsenheter och transformatorer för switchade strömförsörjningsenheter

Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units

Som svensk standard gäller europastandarden EN 61558-2-16:2009. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61558-2-16:2009.

Nationellt förord

Europastandarden EN 61558-2-16:2009

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC

– **IEC 61558-2-16, First edition, 2009 - Safety of transformers, reactors, power supply units and similar products for voltages up to 1 100 V - Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units**

utarbetad inom International Electrotechnical Commission, IEC.

Standarden ska användas tillsammans med SS-EN 61558-1, utgåva 2, 2006 och SS-EN 61558-1/A1, utgåva 1, 2009.

Tidigare fastställd svensk standard SS-EN 61558-2-17, utgåva 1, 1998, gäller ej fr o m 2012-10-01.

ICS 29.180

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EUROPEAN STANDARD

NORME EUROPÉENNE

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English version

Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units

(IEC 61558-2-16:2009)

Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et produits analogues pour des tensions d'alimentation jusqu'à 1 100 V - Partie 2-16: Règles particulières et essais pour les blocs d'alimentation à découpage et les transformateurs pour blocs d'alimentation à découpage (CEI 61558-2-16:2009)

Sicherheit von Transformatoren, Drosseln, Netzgeräten und dergleichen für Versorgungsspannungen bis 1 100 V - Teil 2-16: Besondere Anforderungen und Prüfungen an Schaltnetzteilen (SMPSU) und Transformatoren in Schaltnetzteilen (IEC 61558-2-16:2009)

CENELEC

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

Central Secretariat: Avenue Marnix 17, B - 1000 Brussels

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SEK Svensk Elstandard

Foreword

The text of document 96/330/FDIS, future edition 1 of IEC 61558-2-16, prepared by IEC TC 96, Transformers, reactors, power supply units and similar products for low voltage up to 1 100 V, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61558-2-16 on 2009-10-01.

This European Standard supersedes EN 61558-2-17:1997.

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)	2010-07-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2012-10-01

This standard is to be used in conjunction with EN 61558-1 and its amendments. It is based on EN 61558-1:2005.

This Part 2-16 supplements or modifies the corresponding clauses in EN 61558-1, so as to convert that publication into the European Standard: *Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units.*

When a particular subclause of Part 1 is not mentioned in this part, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text of Part 1 is to be adapted accordingly.

In this part, the following print types are used:

– requirements proper: in roman type;

– *test specifications: in italic type*;

– explanatory matter: in smaller roman type.

In the text of this standard, the words in **bold** are defined in Clause 3.

Subclauses, notes, figures and tables additional to those in Part 1 are numbered starting from 101; supplementary annexes are entitled AA, BB, etc.

Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard IEC 61558-2-16:2009 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

Addition *to Annex ZA of EN 61558-1:*

Publication	Year	Title	EN/HD	Year
IEC 60227	Series	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	– [1)]	–
IEC 60364-4-41 (mod)	– [2)]	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41 + corr. July	2007 [3)] 2007
IEC 60601-1	– [2)]	Medical electrical equipment - Part 1: General requirements for basic safety and essential performance	EN 60601-1	2006 [3)]
IEC 60664-4	2005	Insulation coordination for equipment within low-voltage systems - Part 4: Consideration of high-frequency voltage stress	EN 60664-4 + corr. October	2006 2006
IEC 60950-1 (mod)	– [2)]	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1 + A11	2006 [3)] 2009
IEC 61010-1	– [2)]	Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements	EN 61010-1 + corr. June	2001 [3)] 2002
IEC 61204-7	2006	Low voltage power supplies, d.c. output - Part 7: Safety requirements	EN 61204-7 + A11	2006 2009
IEC 61347 (mod)	Series	Lamp controlgear	EN 61347	Series
IEC 61558-1	2005	Safety of power transformers, power supplies, reactors and similar products - Part 1: General requirements and tests	EN 61558-1 + corr. August	2005 2006
IEC 61558-2-1	– [2)]	Safety of power transformers, power supplies, reactors and similar products - Part 2-1: Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications	EN 61558-2-1	2007 [3)]
IEC 61558-2-4	– [2)]	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-4: Particular requirements and tests for isolating transformers and power supply units incorporating isolating transformers	EN 61558-2-4	2009 [3)]

[1)] The HD 21 series, which is related to, but not directly equivalent with the IEC 60227 series, applies instead.

[2)] Undated reference.

[3)] Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 61558-2-6	– [2)]	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers	EN 61558-2-6	2009 [3)]
IEC 61558-2-13	– [2)]	Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V - Part 2-13: Particular requirements and tests for auto transformers and power supply units incorporating auto transformers	EN 61558-2-13	2009 [3)]
IEC 62040	Series	Uninterruptible Power Systems (UPS)	EN 62040	Series

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SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND SIMILAR PRODUCTS FOR SUPPLY VOLTAGES UP TO 1 100 V –

Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units

1 Scope

Replacement:

This part of IEC 61558 deals with the safety of **switch mode power supply units** and **transformers** for **switch mode power supply units**. **Transformers** incorporating **electronic circuits** are also covered by this standard.

NOTE 1 Safety includes electrical, thermal and mechanical aspects.

This part applies to:

a) **switch mode power supply units** incorporating **safety isolating transformers** providing **SELV, PELV** or **FELV** a.c. or d.c. **output voltage(s)**, or a combination thereof according to IEC 61140 and IEC 60364-4-41 for use with household and other consumer products, except for products covered by IEC 60065, IEC 61347 series, IEC 61204-7 and IEC 60950-1;

b) **switch mode power supply units** with a maximum **output voltage** not exceeding 1 000 V a.c. or 1 414 V ripple-free d.c. for use with household and other consumer products, except for products covered in a) and products covered by IEC 60065, IEC 61347 series, IEC 61204-7 and IEC 60950-1;

c) this standard may be used for **transformers** for use in **switch mode power supply units** (see Annex BB).

This part covers the safety requirements for:

- separating SMPS for general use corresponding to Part 2-1;
- isolating SMPS for general use corresponding to Part 2-4;
- safety isolating SMPS for general use corresponding to Part 2-6;
- auto-SMPS for general use corresponding to Part 2-13.

For SMPS for specific application corresponding to the other Parts 2 of 61558 series, the necessary requirements of the relevant Parts 2 are applicable. In addition, the requirements listed in this part apply. Where the two requirements are in conflict, the most severe take precedence.

NOTE 2 As the maximum **rated supply voltage** of the internal **transforme**r is 1 000 V, the maximum **rated supply voltage** of the **switch mode power supply** may be lower due to type of rectification.

Switch mode power supply units covered by this standard are air cooled (natural or forced) **independent**, **associated**, **stationary**, **portable**, single-phase, or polyphase, with the **rated supply voltage** not exceeding 1 100 V a.c., the **rated supply frequency** not exceeding 500 Hz, the **rated internal operating frequency** exceeding 500 Hz, but not exceeding 100 MHz, and the **rated output** not exceeding 1 kVA or 1 kW, incorporating **dry-type transformers** with encapsulated or non-encapsulated windings.

Associated transformers for **switch mode power supply units** covered by Annex BB of this standard shall have a **rated output** not exceeding:

– 25 kVA for single-phase **transformers**;

– 40 kVA for polyphase **transformers**.

NOTE 3 For higher frequencies, additional requirements may be necessary. However, this standard may be used as a guide.

The **no-load output voltage** or **the rated output voltage** of **switch mode power supply units** shall not exceed:

– 1 000 V a.c. or 1 415 V ripple-free d.c. when **separating transformers** or **auto-transformers** are used;

– 500 V a.c. or 708 V ripple-free d.c. when **isolating transformers** are used;

– 50 V a.c. or 120 V ripple-free d.c. when **safety isolating transformers** are used.

The **no-load output voltage** or the **rated output voltage** of **independent switch mode power supply units** shall not be less than:

– 50 V a.c. or 120 V ripple-free d.c. when **separating transformers** or **autotransformers** are used.

This standard is also applicable to **switch mode power supply units**, converters and inverters without limitation of the **rated output**. However, such **switch mode power supply units** are for special applications and are subject to an agreement between the purchaser and the manufacturer.

NOTE 4 In the context of this standard, converters and invertors are considered to be **switch mode power supply units**.

This standard may also be used as a guide for products not covered by the scope of this standard, the scope of IEC 61204-7, or the scope of IEC 61347 series.

This standard does not apply to:

– motor-generator sets;

– uninterruptible power supplies (UPS) according to IEC 62040;

– **switch mode power supply units** covered by IEC 61204-7 (i.e., low-voltage power supply devices, d.c. output, performance characteristics) and d.c. power and distribution equipment and **switch mode power supply units** for use in applications covered by IEC 60950-1, IEC 61010-1, IEC 60601-1, and IEC 60065;

– lamp control gear covered by IEC 61347-1;

– external circuits and their components intended to be connected to the input terminals and output terminals of the **transformers**.

NOTE 5 IEC 61204-7 will be updated by SC 22E.

NOTE 6 Attention is drawn to the following:

– for **transformers** intended to be used in vehicles, on board ships and aircraft, additional requirements (from other applicable standards, national rules, etc.) may be necessary;

– measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing should also be considered;

– the different conditions for transportation, storage, and operation of the **transformers** should also be considered;

– additional requirements in accordance with other appropriate standards and national rules may be applicable to **transformers** intended for use in special environments, such as tropical environment.

NOTE 7 Future technological development of **transformers** may necessitate a need to increase the upper limit of the frequencies; until then, this part may be used as a guidance document.

Unless otherwise specified, from here onward, the term **SMPS** covers **switch mode power supply units**.

2 Normative references

This clause of Part 1 is applicable, except as follows:

Addition:

IEC 60227 (all parts), *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V*

IEC 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60950-1, *Information technology equipment – Safety – Part 1:General requirements*

IEC 60601-1, *Medical electrical equipment – Part 1:General requirements for basic safety and essential performance*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 61010-1, *Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1:General requirements*

IEC 61204-7:2006, *Low voltage power supplies, d.c. output – Part 7:Safety requirements*

IEC 61347 (all parts), *Lamp controlgear*

IEC 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*

IEC 61558-2-1, *Safety of power transformers, power supplies, reactors and similar products – Part 2-1: Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications*

IEC 61558-2-4, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-4: Particular requirements and tests for isolating transformers and power supply units incorporating isolating transformers*

IEC 61558-2-6, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*

IEC 61558-2-13, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-13: Particular requirements and tests for auto transformers and power supply units incorporating auto transformers*

IEC 62040 (all parts), *Uninterruptible power systems (UPS)*