



NSAI
Standards

Irish Standard
I.S. EN 61558-2-10:2014

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-10: Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V

I.S. EN 61558-2-10:2014

Incorporating amendments/corrigenda/National Annexes issued since publication:

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EUROPEAN STANDARD

EN 61558-2-10

NORME EUROPÉENNE

EUROPÄISCHE NORM

May 2014

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English Version

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-10: Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V (IEC 61558-2-10:2014)

Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments -
Partie 2-10: Règles particulières et essais pour les transformateurs d'isolement à enroulements séparés à niveau d'isolement élevé et pour les transformateurs d'isolement à enroulements séparés à tensions secondaires supérieures à 1 000 V
(CEI 61558-2-10:2014)

Sicherheit von Transformatoren, Netzgeräten, Drosseln und dergleichen - Teil 2-10: Besondere Anforderungen und Prüfungen an Netztransformatoren mit hohem Isolationspegel und Netztransformatoren mit Ausgangsspannungen über 1 000 V
(IEC 61558-2-10:2014)

This European Standard was approved by CENELEC on 2014-05-15. 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: Avenue Marnix 17, B-1000 Brussels

Foreword

The text of document 96/407/FDIS, future IEC 61558-2-10, prepared by IEC/TC 96, "Transformers, reactors, power supply units and combinations thereof" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61558-2-10:2014.

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) 2015-02-15
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-05-15

This Part 2-10 is intended to be used in conjunction with the latest edition of EN 61558-1 and its amendments.

This Part 2-10 supplements or modifies the corresponding clauses in EN 61558-1, so as to convert that publication into the IEC standard: Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V.

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

In this part, the following print types are used:

- requirements proper: in roman type;
- test specifications: in italic type;
- explanatory matters: in smaller roman type.

In the text of this part 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.

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Endorsement notice

The text of the International Standard IEC 61558-2-10:2014 was approved by CENELEC as a European Standard without any modification.

In the Bibliography of EN 61558-1:2005, the following note has to be **added** for the standard indicated:
Addition:

IEC 60076-11	NOTE	Harmonised as EN 60076-11 (not modified).
IEC 61050	NOTE	Harmonised as EN 61050 (modified).
IEC 61347-2-10:2000	NOTE	Harmonised as EN 61347-2-10:2001 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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

Annex ZA of EN 61558-1:2005 applies, except as follows:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61558-1	2005	Safety of power transformers, power supplies, reactors and similar products -- Part 1: General requirements and tests	EN 61558-1	2005
			+EN 61558-1:2005/corrigendum Aug. 2006	2006
IEC 61558-2-16	-	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	EN 61558-2-16	-

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IEC 61558-2-10

Edition 1.0 2014-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety of transformers, reactors, power supply units and combinations thereof –
Part 2-10: Particular requirements and tests for separating transformers with
high insulation level and separating transformers with output voltages
exceeding 1 000 V**

**Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des
combinaisons de ces éléments –
Partie 2-10: Règles particulières et essais pour les transformateurs d'isolement à
enroulements séparés à niveau d'isolement élevé et pour les transformateurs
d'isolement à enroulements séparés à tensions secondaires supérieures
à 1 000 V**



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IEC 61558-2-10

Edition 1.0 2014-04

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Safety of transformers, reactors, power supply units and combinations thereof –
Part 2-10: Particular requirements and tests for separating transformers with
high insulation level and separating transformers with output voltages
exceeding 1 000 V**

**Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des
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d'isolement à enroulements séparés à tensions secondaires supérieures
à 1 000 V**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-10: Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V

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 61558-2-10 has been prepared by IEC technical committee 96: Transformers, reactors, power supply units, and combinations thereof.

This first edition cancels and replaces Chapter II Section Three of IEC 60989 published in 1991.

It constitutes a technical revision. The main changes consist of

- a) updating this part in accordance with IEC 61558-1:2005, and
- b) adding **power supply units** to the scope.

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

FDIS	Report on voting
96/407/FDIS	96/408/RVD

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

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

This Part 2-10 is intended to be used in conjunction with the latest edition of IEC 61558-1 and its amendments. It is based on the second edition (2005) of that standard and its Amendment 1 (2009).

This Part 2-10 supplements or modifies the corresponding clauses in IEC 61558-1, so as to convert that publication into the IEC standard: *Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V*.

A list of all parts of the IEC 61558 series, under the general title: *Safety of transformers, reactors, power supply units and combinations thereof*, can be found on the IEC website.

Future standards in this series will carry the new general title as cited above. Titles of existing standards in this series will be updated at the time of the next edition.

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

In this part, the following print types are used:

- requirements proper: in roman type;
- *test specifications: in italic type;*
- explanatory matters: in smaller roman type.

In the text of this part 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.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

NOTE The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months from the date of publication.

The transitional period is not longer than 3 years after the publication of this standard.

SAFETY OF TRANSFORMERS, REACTORS, POWER SUPPLY UNITS AND COMBINATIONS THEREOF –

Part 2-10: Particular requirements and tests for separating transformers with high insulation level and separating transformers with output voltages exceeding 1 000 V

1 Scope

Replacement:

This part of IEC 61558 deals with the safety of **separating transformers** with high **insulation level** and **separating transformers** with **output voltages** exceeding 1 000 V. **Transformers** incorporating **electronic circuits** are also covered by this standard.

NOTE 1 Safety includes electrical, thermal and mechanical aspects.

Unless otherwise specified, from here onward, the term **transformer** covers **separating transformers with high insulation level** and **separating transformers with output voltages** exceeding 1 000 V a.c or 1 500 V d.c .

This Part 2-10 is applicable to **stationary** or **portable**, single-phase or polyphase, air-cooled (natural or forced) **independent** or **associated dry-type transformers**. The windings may be encapsulated or non-encapsulated.

This standard is applicable to **transformers** and **power supply** (linear) with **internal operational frequencies** not exceeding 500 Hz.

This standard used in combination with Part 2-16 for **switch mode power supply units (SMPS)** is also applicable to power supplies with **internal operational frequencies** higher than 500 Hz. Where the two requirements are in conflict the most severe take precedence.

The **rated supply voltage** does not exceed 1 000 V a.c., and the **rated supply frequency** and the **internal operating frequency** do not exceed 500 Hz.

The **rated output** does not exceed:

- 25 kVA for single-phase **transformers**;
- 40 kVA for polyphase **transformers**.

This Part 2-10 is applicable to **transformers** without limitation of the **rated output** subject to an agreement between the purchaser and the manufacturer.

Where applicable the **no-load output voltage** or the **rated output voltage**:

- does not exceed 1 000 V a.c. or 1 500 V d.c. for **separating transformers with high insulation level**;
- does exceed 1 000 V a. c or 1 500 V d.c. and does not exceed 15 000 V a.c. or 15 000 V d.c. for **separating transformer with output voltage** exceed 1 000 V.

This Part 2-10 is not applicable to:

- **transformers** covered by IEC 60076-11;

- neon **transformers** covered by IEC 61050 and
- **power supplies** and converters for use with or in products according to IEC 61347-2-10.

This Part 2-10 is not applicable to external circuits and their components intended to be connected to the input terminals and output terminals of the **transformers**.

Transformers covered by this Part 2-10 are used only in applications where **double or reinforced insulation** between circuits is not required by the installation rules or by the end product standard.

NOTE 2 Normally, the **transformers** are intended to be used with equipment to provide voltages different from the **supply voltage** for the functional requirements of the equipment. The protection against electric shock can be provided (or completed) by other features of the equipment, such as the **body**. Parts of **output circuits** can be connected to the **input circuits** or to **protective earth**.

This Part 2-10 is applicable to **transformers** associated with specific equipment, to the extent decided upon by the relevant IEC technical committees.

NOTE 3 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.) can 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 can also be considered;
- the different conditions for transportation, storage, and operation of the can also be considered;
- additional requirements in accordance with other appropriate standards and national rules can be applicable to **transformers** intended for use in special environments, such as tropical environment.

NOTE 4 Future technological development of **transformers** can necessitate a need to increase the upper limit of the frequencies, until then this Part 2-10 can be used as a guidance document.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

IEC 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*
Amendment 1:2009

IEC 61558-2-16, *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*

3 Terms and definitions

This clause of Part 1 is applicable except as follows:

The third paragraph is not applicable.

3.1 Transformers

Addition:

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