SLOVENSKI STANDARD
oSIST prEN IEC 61558-2-2:2021

01-november-2021

Varnost transformatorjev, dušilk, napajalnikov in kombinacij teh elementov - 2-2. del: Posebne zahteve in preskusi za kontrolne transformatorje in napajalnike s kontrolnimi transformatorji

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-2: Particular requirements and tests for control transformers and power supply units incorporating control transformers

Sécurité des transformateurs, alimentations, bobines d'inductance et produits analogues - Partie 2-2: Règles particulières et essais pour les transformateurs de commande et les alimentations incorporant les transformateurs de commande

Ta slovenski standard je istoveten z: **prEN IEC 61558-2-2:2021**

ICS:

29.180	Transformatorji. Dušilke	Transformers. Reactors

oSIST prEN IEC 61558-2-2:2021 **en**

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COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61558-2-2 ED3**	
DATE OF CIRCULATION: **2021-10-01**	CLOSING DATE FOR VOTING: **2021-12-24**
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IEC TC 96 : TRANSFORMERS, REACTORS, POWER SUPPLY UNITS, AND COMBINATIONS THEREOF

SECRETARIAT: Germany	SECRETARY: Mr Wolfgang Reichelt
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 3C,TC 14,TC 22,SC 22E,SC 34C,TC 51,TC 55,TC 61,SC 62A,TC 64,TC 66,TC 77,TC 85,TC 97,TC 106,TC 108,TC 109,TC 111,TC 112	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING ☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

Attention IEC-CENELEC parallel voting

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting.

The CENELEC members are invited to vote through the CENELEC online voting system.

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Safety of transformers, reactors, power supply units and combinations thereof - Part 2-2: Particular requirements and tests for control transformers and power supply units incorporating control transformers

PROPOSED STABILITY DATE: 2025

NOTE FROM TC/SC OFFICERS:

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

Part 2-2: Particular requirements and tests for control transformers and power supply units incorporating control transformers

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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9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This third edition cancels and replaces the second edition published in 2007. This edition constitutes a technical revision.

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

a) Adjustment of structure and references in accordance with IEC 61558-1:2017;

b) New general symbol for control transformers

c) New symbol for power supply unit with linearly regulated output voltage.

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

Draft	Report on voting
96/XXX/FDIS	96/XXX/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

It has the status of a group safety publication in accordance with IEC Guide 104.

This International Standard is to be used in conjunction with IEC 61558-1:2017.

NOTE When “Part 1” is mentioned in this standard, it refers to IEC 61558-1:2017.

This document supplements or modifies the corresponding clauses in IEC 61558-1:2017, so as to convert that publication into the IEC standard: *Particular requirements and tests for control transformers and power supply units incorporating control transformers.*

A list of all parts in the IEC 61558 series published 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.

Where this document states "*addition*", "*modification*" or "*replacement*", the relevant text of IEC 61558-1:2017 is to be adopted accordingly.

In this document, 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 document, the words in **bold** are defined in Clause 3.

Subclauses, notes, figures and tables additional to those in IEC 61558-1:2017 are numbered starting from 101; supplementary annexes are entitled AA, BB, etc.

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.

INTRODUCTION

IEC TC 96 has a group safety function in accordance with IEC Guide 104 for transformers other than those intended to supply distribution networks, in particular transformers and power supply units intended to allow the application of protective measures against electric shock as defined by TC 64, but in certain cases including the limitation of voltage and horizontal safety function for SELV, in accordance with IEC 60364-4-41.

The group safety function (GSF) is necessary because of responsibility for example for safety extra-low voltage (SELV) in accordance with IEC 61140:2016, 5.2.6 and IEC 60364-4-41:2005, 414.3.1 or control circuits in accordance with IEC 60204-1:2016, 7.2.4.

The group safety function is needed for each part of IEC 61558-2 because different standards of the IEC 61558 series can be combined in one construction but in certain cases with no limitation of rated output power.

For example an auto-transformer in accordance with IEC 61558-2-13 can be designed with a separate SELV-circuit in accordance with the particular requirements for IEC 61558-2-6 relating to the general requirements of IEC 61558-1.

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

Part 2-2: Particular requirements and tests for control transformers and power supply units incorporating control transformers

1 Scope

Replacement

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

NOTE 1 Safety includes electrical, thermal and mechanical aspects.

Unless otherwise specified, from here onward, the term **transformer** covers **control transformers** and **power supply units** incorporating **control transformers**.

For **power supply units** (linear) this document is applicable. For **switch mode power supply units** IEC 61558-2-16 is applicable together with this document. Where two requirements are in conflict, the most severe take precedence.

This document does not apply to **transformers** covered by IEC 60076-11.

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

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

The **rated thermal output** does not exceed:

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

This document is applicable to **transformers** without limitation of the **rated thermal output**, subject to an agreement between the purchaser and the manufacturer.

NOTE 2 **Transformers** intended to supply distribution networks are not included in the scope.

The **no-load output voltage** or the **rated output voltage** does not exceed 1 000 V AC or 1 415 V ripple-free DC. For **independent transformers** the **no-load output voltage** and / or the **rated output voltage** is not less than 50 V AC or 120 V ripple-free DC.

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

NOTE 3 **Transformers** covered by this document are only used in applications where double or reinforced insulation between circuits is not required by the installation rules or by the end product standard.

NOTE 4 Normally the **control 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 may be provided or completed by other features of the equipment, such as the **body**. Parts of **output circuits** may be connected to the **input circuits** or to protective earthing.

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.);
- measures to protect the **enclosure** and the components inside the enclosure against external influences such as fungus, vermin, termites, solar-radiation, and icing;
- the different conditions for transportation, storage, and operation of the **transformers**;
- additional requirements in accordance with other appropriate standards and national rules may be applicable to **transformers** intended for use in special environments.

Future technological development of **transformers** may necessitate a need to increase the upper limit of the frequencies. Until then this document may be used as a guidance document.

This GROUP SAFETY PUBLICATION focusing on SAFETY guidance is primarily intended to be used as a PRODUCT SAFETY STANDARD for the products mentioned in the scope, but is also intended to be used by TCs in the preparation of publications for products similar to those mentioned in the scope of this GROUP SAFETY PUBLICATION, in accordance with the principles laid down in IEC Guide 104 and ISO/IEC Guide 51.

One of the RESPONSIBILITIES of a TC is, wherever applicable, to make use of BSPs and/or GSPs in the preparation of its publications.

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition

IEC 61558-1:2017, *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in Part 1 apply, except as follows:

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

Addition

3.1.101
control transformer
transformer intended to supply power to control circuits (e.g. controlling, signalling, interlocking, etc.)

3.5.101
rated thermal output
product of the **rated output voltage** and the **rated output current**, or for polyphase **transformers**, the appropriate factor (e. g. for three-phase transformers $\sqrt{3}$) times the product

of the **rated output voltage** and the **rated output current** delivered in continuous operation loaded at **power factor** 1

If the **transformer** has more than one **output winding** or/and tapped **output winding**, the **rated output** denotes the sum of the products of **rated output voltage** and **rated output current** for **output circuits** intended to be loaded simultaneously.

3.5.102
admissible instantaneous output
product of the **rated output voltage** and the **rated instantaneous output current**, or for polyphase **transformers**, the appropriate factor (e. g. for three-phase transformers $\sqrt{3}$) times the product of the **rated output voltage** and the **rated instantaneous output current** delivered at **power factor** 0,5

If the **transformer** has more than one **output winding** or/and tapped **output winding**, the **rated output** denotes the sum of the products of **rated output voltage** and **rated instantaneous output current** for **output circuits** intended to be loaded simultaneously.

3.5.103
rated instantaneous output current
output current for the specific operating conditions at the **rated output voltage** and the **rated supply frequency** at **power factor** 0,5 assigned to the **transformer** by the manufacturer

4 General requirements

This clause of Part 1 is applicable.

5 General notes on tests

This clause of Part 1 is applicable.

6 Ratings

This clause of Part 1 is applicable except as follows:

Addition

6.101 The **rated output voltage** shall not exceed 1 000 V AC or 1 415 V ripple-free DC and for **independent transformers** shall exceed 50 V AC or 120 V ripple-free DC.

For **independent transformers**, this output voltage limitation applies even when **output windings**, not intended for interconnection, are connected in series.

6.102 The **rated thermal output** shall not exceed:

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

Transformers without limitation of the **rated thermal output** shall be subject to agreement between the purchaser and the manufacturer.

6.103 The **rated supply frequency** and the **internal operating frequencies** shall not exceed 500 Hz.

6.104 The **rated supply voltage** shall not exceed 1 000 V AC.