

INTERNATIONAL STANDARD



GROUP SAFETY PUBLICATION

**Safety of transformers, reactors, power supply units and combinations thereof –
Part 2-3: Particular requirements and tests for ignition transformers for gas and
oil burners**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**SAFETY OF TRANSFORMERS, REACTORS,
POWER SUPPLY UNITS AND COMBINATIONS THEREOF –****Part 2-3: Particular requirements and tests for ignition
transformers for gas and oil burners**

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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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61558-2-3:2010. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

International standard IEC 61558-2-3 has been prepared by IEC technical committee 96: Transformers, reactors, power supply units and combinations thereof. It is an International Standard.

This third edition cancels and replaces the second 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) adjustment of structure and references in accordance with IEC 61558-1:2017.

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

Draft	Report on voting
96/577/FDIS	96/580/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/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.

<https://standards.iec.ch> 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 ignition transformers for gas and oil burners*.

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 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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

The contents of the corrigendum 1 (2023-09) have been included in this copy.

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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, which is about Electrical installations and protection against electric shock, 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 used because of responsibility 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 used for each part of the IEC 61558-2 series 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.

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

Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners

1 Scope

Replacement:

This part of IEC 61558 deals with the safety of **ignition transformers** for gas and oil burners. **Ignition transformers** incorporating **electronic circuits** are also covered by this document.

NOTE 1 Safety includes electrical, thermal, and mechanical ~~and chemical~~ aspects.

Unless otherwise specified, from here onward, the term **transformer** covers **ignition transformers** for gas and oil burners.

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 takes precedence.

This document is applicable to **fixed** single-phase, air-cooled (natural or forced) **associated dry-type transformers** used in the ignition systems of gas and oil burners. The windings ~~may~~ 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 ~~operational frequency~~ operating frequencies** do not exceed 500 Hz.

The **rated short-circuit output current** does not exceed 500 mA AC.

The **no-load output voltage** or the **rated output voltage** does not exceed 15 000 V AC.

This part is not applicable to external circuits and their components intended to be connected to the input and output terminals or socket-outlets of the **transformers**.

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

~~NOTE 2~~ Attention is drawn to the following, if necessary:

- 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~~ can be applicable to **transformers** intended for use in special environments.

~~NOTE 3~~ Future technological development of **transformers** ~~may~~ can necessitate a need to increase the upper limit of the frequencies. Until then this document ~~may~~ can 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 technical committees 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 technical committee is, wherever applicable, to make use of basic safety publications and/or group safety publications in the preparation of its publications.

2 Normative references

This clause of IEC 61558-1:2017 is applicable, except as follows:

Addition:

IEC 61558-1:~~2005~~2017, ~~Safety of power transformers, power supplies, reactors and similar products~~ *Safety of transformers, reactors, power supply units and combinations thereof – Part 1: General requirements and tests*

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and combinations thereof – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications*

ISO 3864-1:~~2002~~2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs ~~in workplaces and public areas~~ and safety markings*

3 Terms and definitions

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

For the purposes of this document, the terms and definitions given in IEC 61558-1:2017 apply, except as follows:

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

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

3.1 Transformers

Addition:

3.1.101

ignition transformer

fixed single-phase, air-cooled **associated transformer** within an ignition system generating an arc between two electrodes connected to the high voltage output of the **transformer**

Note 1 to entry: This **transformer** is intended to be used with a control unit built-in in the ignition system.

~~3.1.102~~3.101

rated duty factor

time interval during which the **transformer** operates, expressed as a percentage of the duration of the entire cycle

3.5.101**rated short-circuit output current**

output current at the **rated supply voltage** and the **rated frequency** when the **output winding** is short-circuited, assigned to the **transformer** by the manufacturer

3.5.102**rated no-load output voltage**

output voltage when the **transformer** is connected to the **rated supply voltage** at the **rated supply frequency** under no-load conditions, assigned to the **transformer** by the manufacturer

3.5 Ratings

Replacement:

3.5.4 not applicable.

3.5.5 not applicable.

4 General requirements

This clause of IEC 61558-1:2017 is applicable.

5 General notes on tests

This clause of IEC 61558-1:2017 is applicable.

6 Ratings

This clause of IEC 61558-1:2017 is applicable, except as follows:

Addition:

6.101 The **rated no-load output voltage** shall not exceed 15 000 V AC.

6.102 Void.

6.103 The **rated frequency** shall not exceed 500 Hz.

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

6.105 The **rated short-circuit output current** shall not exceed 500 mA AC.

6.106 Preferred values of the **rated no-load output voltage**, the **rated short-circuit output current**, and the **rated duty factor** are given in ~~Table 101~~ Table 102.

Compliance with the requirements of 6.101 to 6.106 is checked by inspection of the marking.

7 Classification

This clause of IEC 61558-1:2017 is applicable, except as follows:

7.1

Replacement:

7.1 According to their protection against electric shock:

- **class I transformers**, for specific use only.

NOTE **Incorporated transformers** are not classified. Their class of protection against electric shock is determined by the way the **transformer** is incorporated.

7.2

Replacement:

7.2 According to short-circuit protection or protection against abnormal conditions:

- **inherently short-circuit proof transformers;**
- **fail-safe transformers.**

7.4

Replacement:

7.4 According to their mobility:

- fixed **ignition transformers** for gas and oil burners.

7.5

Replacement:

7.5 According to their duty type:

- **continuous duty;**
- **intermittent duty cycle.**

7.6

7.6 This clause of IEC 61558-1:2017 is applicable, except as follows:

Replacement:

7.6.2 This subclause of IEC 61558-1:2017 is not applicable.

7.8

Replacement:

7.8 According to their **transient overvoltage condition:**

- **overvoltage category II.**

8 Marking and other information

This clause of IEC 61558-1:2017 is applicable except as follows:

8.1

Replacement:

Items b), c), d), and f) are not applicable.

~~8.1 h) *Replacement:*~~

~~Transformers shall be marked with one of the graphical symbols shown in 8.11;~~

h)

Replacement of the content up to the first semi-colon by the following:

relevant graphical symbols shown in Table 101 that indicate the kind of **transformer**;

~~8.1 q) *Replacement:*~~

p)

Replacement:

Transformers for intermittent duty cycle shall be marked with the **rated duty factor** expressed as a percentage and the duration of the entire cycle expressed in minutes.

NOTE Preferred value for the entire cycle of **intermittent duty** is 3 min.

Addition:

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8.1.101 Transformers shall be marked with the graphical symbol according to 8.11 with the colour in accordance with ISO 3864-1.

For **incorporated transformers**, the above graphical symbol ~~may~~ can be either on the **transformer** or on the equipment placed close to the **transformer**. If the graphical symbol is not on the **transformer**, the manufacturer shall state in the instruction sheets that this graphical symbol shall be placed on the equipment close to the **transformer**.

8.1.102 Transformers shall be marked with the **rated short-circuit output current** in milliamperes and with the **rated no-load output voltage** in kV.

8.11

Addition:

Table 101 – Symbols indicating the kind of transformer

Symbol or graphical symbol	Explanation or title	Identification
	<p>Inherently short-circuit proof ignition transformer with one end of the output winding for connection to the protective earth earthing</p>	<p>IEC 60417-6198:2013-04</p>
	<p>Inherently short-circuit proof ignition transformer with the midpoint of the output winding for connection to the protective earth earthing</p>	<p>IEC 60417-6199:2013-04</p>
	<p>Fail-safe ignition transformer with one end of the output winding for connection to the protective earth earthing</p>	<p>IEC 60417-6198:2013-04</p>
	<p>Fail-safe ignition transformer with the midpoint of the output winding for connection to the protective earth earthing</p>	<p>IEC 60417-6199:2013-04</p>

8.14

Addition:

Ultimate safety of **transformers** is dependent upon the control unit and this shall be stated in the instruction sheet.

9 Protection against electric shock

This clause of IEC 61558-1:2017 is applicable.