

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**

Document Preview

[IEC 61558-2-3:2023](https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023)

<https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023>



THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2023 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch

Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org

The world's leading online dictionary on electrotechnology, containing more than 22 300 terminological entries in English and French, with equivalent terms in 19 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

International Standards
Document Preview

[IEC 61558-2-3:2023](https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023)

<https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023>



IEC 61558-2-3

Edition 3.0 2023-06
REDLINE VERSION

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**

Document Preview

[IEC 61558-2-3:2023](https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023)

<https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.180

ISBN 978-2-8322-7157-5

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	2
1 Scope.....	7
2 Normative references	8
3 Terms and definitions	8
4 General requirements	9
5 General notes on tests	9
6 Ratings.....	9
7 Classification.....	9
8 Marking and other information	10
9 Protection against electric shock	12
10 Change of input voltage setting	13
11 Output voltage and output current under load	13
11 Output voltage and output current.....	13
12 No-load output voltage	14
13 Short-circuit voltage.....	14
14 Heating.....	14
15 Short-circuit and overload protection	14
16 Mechanical strength	15
17 Protection against harmful ingress of dust, solid objects and moisture.....	15
18 Insulation resistance, dielectric strength and leakage current	16
19 Construction	16
20 Components	17
21 Internal wiring.....	17
22 Supply connection and other external flexible cable or cords	18
23 Terminals for external conductors.....	18
24 Provisions for protective earthing.....	18
25 Screws and connections	18
26 Creepage distances, clearances and distances through insulation.....	18
27 Resistance to heat, fire and tracking.....	19
28 Resistance to rusting.....	19
Annexes	21
Bibliography.....	22
Figure 101 – Arcing horn	20
Table 101 – Symbols indicating the kind of transformer	12
Table 101 102 – Preferred values of operational parameters	13
Table 102 103 – Test time for short-circuit test	15
Table 103 104 – Creepage distances and clearances for output terminals	19

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 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.

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://www.iec.ch/standards/docs/IEC_61558-2-3-2023 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.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[IEC 61558-2-3:2023](https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023)

<https://standards.iteh.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023>

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.

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[IEC 61558-2-3:2023](https://standards.itih.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023)

<https://standards.itih.ai/catalog/standards/iec/d187ea39-e23c-4112-8144-0392015b0fbf/iec-61558-2-3-2023>

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.

<https://www.intelstandards.com/standards/iec-61558-2-3-2023>
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:

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

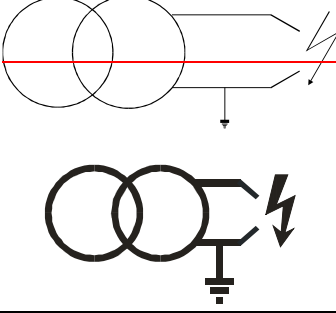
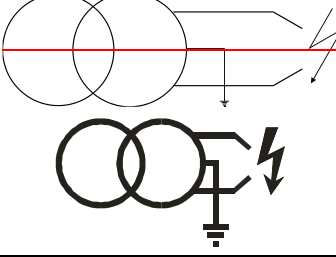
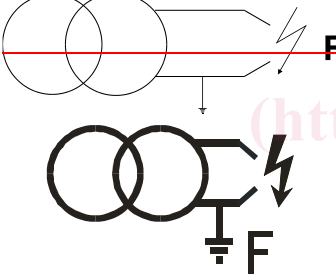
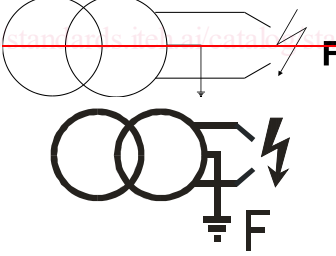
For **incorporated transformers**, the above graphical symbol ~~may~~ can be either on the **transformer** or on the equipment placed close to the **transformer**. If the graphical symbol is not on the **transformer**, the manufacturer shall state in the instruction sheets that this graphical symbol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