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INTERNATIONAL STANDARD

NORME INTERNATIONALE

GROUP SAFETY PUBLICATION
PUBLICATION GROUPÉE DE SÉCURITÉ

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

Sécurité des transformateurs, bobines d'inductance, blocs d'alimentation et des combinaisons de ces éléments – Partie 2-3: Règles particulières et essais pour les transformateurs d'allumage pour brûleurs à gaz et combustibles liquides

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

This second edition cancels and replaces the first edition published in 1999. It constitutes a technical revision. The main changes consist of updating this part in accordance with IEC 61558-1:2005.

This part has the status of a group safety publication in accordance with IEC Guide 104: 1997, *The preparation of safety publications and the use of basic safety publications and group safety publications*.

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

FDIS	Report on voting
96/357/FDIS	96/364/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 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.

This part 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 ignition for gas and oil burners*.

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.

Where 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.

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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.

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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 standard.

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

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

This part applies 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 be encapsulated or non-encapsulated.

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

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

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

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.**

Transformers covered by this part 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:

- 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.

NOTE 3 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.

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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*

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

3 Terms and definitions

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

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

3.1.102
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

Replacement:

3.5.4 not applicable.

3.5.5 not applicable.

4 General requirements

This clause of Part 1 is applicable.

5 General notes on tests

This clause of Part 1 is applicable.

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6 Ratings

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

Addition:

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

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 a.c.

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

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.

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

7 Classification

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

7.1 *Replacement:*

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:*

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

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

7.4 *Replacement:*

According to their mobility:

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

7.5 *Replacement:*

According to their duty type:

– **continuous duty;**
– **intermittent duty cycle.**

7.6

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This clause of Part 1 is applicable, except as follows

7.6.2 not applicable.

8 Marking and other information

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

8.1 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;

8.1 q) *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.

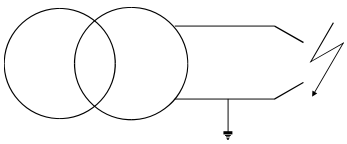
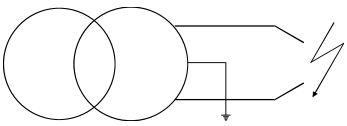
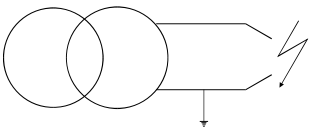
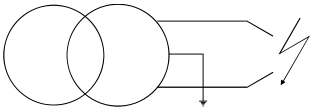
Addition:

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 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:*

Symbol or graphical symbol	Explanation or title	Identification
	**Inherently short-circuit proof ignition transformer** with one end of the **output winding** for connection to the protective earth	
	**Inherently short-circuit proof ignition transformer** with the midpoint of the **output winding** for connection to the protective earth	
 F	**Fail-safe ignition transformer** with one end of the **output winding** for connection to the protective earth	
 F	**Fail-safe ignition transformer** with the midpoint of the **output winding** for connection to the protective earth	

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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 Part 1 is applicable.

10 Change of input voltage setting

This clause of Part 1 is applicable.

11 Output voltage and output current under load

Replacement:

11 Output voltage and output current

11.1 The output current shall not differ from the **rated short-circuit output current** by more than 10 %.

Compliance is checked by the following test:

*The output terminals of the **transformer** are short-circuited by means of a suitable ammeter. The **transformer** is connected to the **rated supply voltage** at the **rated frequency** and operated at the **rated duty factor** until steady-state conditions are reached. The output current is then measured.*

*With the supply voltage reduced to 85 %, the minimum output current value shall not be less than 70 % of the **rated short-circuit output current**.*

11.2 *The **no-load output voltage** shall not differ from the **rated no-load output voltage** by more than 10 %.*

Compliance is checked by the following test:

*The **transformer** is connected to the **rated supply voltage** at the **rated frequency**. The r.m.s. value of the **no-load output voltage** is measured. During this test, the protective earthing terminal shall be connected to the protective earth.*

NOTE The test equipment should be selected such that no voltage rise occurs due to the capacitance (i.e., increase in the capacitance) in the test equipment or measurement network.

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