
Safety of power transformers, power supply units and similar devices - Part 2-20:
Particular requirements for small reactors (IEC 61558-2-20:2000)

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EUROPEAN STANDARD

EN 61558-2-20

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2000

ICS 29.180

English version

**Safety of power transformers, power supply units and similar devices
Part 2-20: Particular requirements for small reactors
(IEC 61558-2-20:2000)**

Sécurité des transformateurs, blocs
d'alimentation et dispositifs analogues
Partie 2-20: Règles particulières pour
les petites bobines d'inductance
(CEI 61558-2-20:2000)

Sicherheit von Transformatoren,
Netzgeräten und Dergleichen
Teil 2-20: Besondere Anforderungen
an Kleindrosseln
(IEC 61558-2-20:2000)

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This European Standard was approved by CENELEC on 2000-08-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 96/146/FDIS, future edition 1 of IEC 61558-2-20, prepared by IEC TC 96, Small power transformers, reactors and power supply units: Safety requirements, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61558-2-20 on 2000-08-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2001-05-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2003-08-01

This part 2-20 is to be used in conjunction with EN 61558-1:1997, Safety of power transformers, power supply units and similar -- Part 1: General requirements and tests.

This part 2-20 supplements or modifies the corresponding clauses of EN 61558-1.

Where a particular clause or subclause of part 1 is not mentioned in this part 2-20, that clause or subclause applies as far as is reasonable. Where this part 2-20 states "addition", "modification" or "replacement", the relevant text of part 1 is to be adapted accordingly.

In this standard, the following print types are used:

- requirement: in roman type;
- *test specifications: in italic type;*
- notes: in smaller roman type.

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In the text of this standard, the words in bold are defined in clause 3.

Subclauses which are additional to those in part 1 are numbered starting from 101.

Endorsement notice

The text of the International Standard IEC 61558-2-20:2000 was approved by CENELEC as a European Standard without any modification.

In the official version, for annex S, Bibliography, the following notes have to be added for the standards indicated:

- IEC 60289 NOTE: Harmonized as EN 60289:1994 (modified).
 - IEC 60920 NOTE: Harmonized as EN 60920:1991 (not modified).
 - IEC 60922 NOTE: Harmonized as EN 60922:1997 (not modified).
-

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**Sécurité des transformateurs,
blocs d'alimentation et dispositifs analogues –**

**Partie 2-20:
Règles particulières pour les petites bobines
d'inductance**

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**Part 2-20:
Particular requirements for small reactors**

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF POWER TRANSFORMERS,
POWER SUPPLY UNITS AND SIMILAR DEVICES –

Part 2-20: Particular requirements for small reactors

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a world-wide organisation for standardisation comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The IEC collaborates closely with the International Organisation for Standardisation (ISO) in accordance with conditions determined by agreement between the two organisations.
- 2) The formal decisions or agreements of the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patents rights. The IEC shall not be held responsible for identifying any or all such patents rights.

International standard IEC 61558-2-20 has been prepared by technical committee 96: Small power transformers, reactors and power supply units: safety requirements.

It has the status of a group safety publication in accordance with IEC Guide 104: Guide for the drafting of safety standards, and the role of committees with safety pilot functions and safety group functions (1984).

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

FDIS	Report on voting
96/146/FDIS	96/149/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 3.

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.

This part 2-20 is intended to be used in conjunction with IEC 61558-1. It was established on the basis of the first edition (1997) of that standard.

This part 2-20 supplements or modifies the corresponding clauses in IEC 61558-1, so as to convert that publication into the IEC standard: Particular requirements for small reactors.

When a particular subclause of part 1 is not mentioned in this part 2-20, that subclause applies as far as is reasonable. Where this standard states "addition", "modification" or "replacement", the relevant text of part 1 is to be adapted accordingly.

In this standard, 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 the standard the words in **bold** are defined in clause 3.

Subclauses which are 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 2004-12. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

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SAFETY OF POWER TRANSFORMERS, POWER SUPPLY UNITS AND SIMILAR DEVICES –

Part 2-20: Particular requirements for small reactors

1 Scope

Replacement:

This part of IEC 61558 applies to stationary or portable, single-phase or poly-phase, air-cooled (natural or forced) general purpose small **reactors**, including alternating current, premagnetised and current compensated **reactors**, independent or associated, having a **rated supply voltage** not exceeding 1 000 V a.c. or d.c. and **rated frequency** not exceeding 1 MHz, the **rated power** not exceeding

- 2 kVAR a.c. (2 kW d.c.) for single-phase **reactors**;
- 10 kVAR a.c. (10 kW d.c.) for poly-phase **reactors**.

This standard is also applicable to small **reactors** without limitation of the **rated power**; however, such small **reactors** are considered as special **reactors** and are subjected to an agreement between the purchaser and the supplier.

This standard is applicable to **dry-type** small **reactors**. The windings may be encapsulated or non-encapsulated.

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This standard does not apply to <https://standards.iteh.ai/catalog/standards/sist/59b7d0cf-14b8-4dcc-ab42-58ab292be8a8/sist-en-61558-2-20-2001>

- **reactors** covered by IEC 60289;
- ballast for tubular fluorescent lamps covered by IEC 60920;
- ballast for discharge lamps (excluding tubular fluorescent lamps) covered by IEC 60922.

NOTE 1 For small **reactors** filled with liquid dielectric or pulverised material such as sand, additional requirements are under consideration.

NOTE 2 In locations where special environmental conditions prevail, particular requirements may be necessary.

NOTE 3 Normally, small **reactors** are intended to be associated with equipment for functional requirements of the equipment or requirements by the installation rules or by other appliance specifications.

NOTE 4 Small **reactors** incorporating electronic circuits and components are also covered by this standard.

NOTE 5 The safety insulation may be provided (or completed) by other parts or features of the equipment, such as the **body**.

NOTE 6 Small **reactors** for particular applications will in the future be covered by complementary normative annexes.

2 Normative references

This clause of part 1 is applicable.

3 Definitions

This clause of part 1 is applicable except as follows:

Modification:

Where part 1 is applicable, the word "transformer", if used, shall be replaced by "**reactor**".

Addition:

3.1.101 reactor

arrangement comprising one or more windings with an impedance depending on the frequency, working in accordance with the principle of self-induction whereby a magnetising current generates a magnetic field through a magnetically effective core or through air

NOTE **Reactors** with toroidal core are also included in this definition.

3.1.102 alternating current reactor

reactor in which the magnetising current generates an alternating magnetic field, changing its polarity depending on the frequency

3.1.103 premagnetised reactor

reactor in which the magnetising direct current generates a magnetic field of only one polarity, while a superimposed alternating current alters the direct magnetic field depending on its strength and the frequency

3.1.104 current compensated reactor

reactor with at least two windings on a common core, where the magnetising currents are in opposite directions in order to reduce the magnetic flux

3.1.105 overload proof reactor

reactor in which the temperature does not exceed the specified limits when the **reactor** is overloaded and which continues to meet all requirements of this standard after the removal of the overload

3.1.105.1 non-inherently overload proof reactor

overload proof reactor equipped with a protective device which opens the circuit, or reduces the current in the circuit when the **reactor** is overloaded, and which continues to meet all requirements of this standard after the removal of the overload and resetting or replacing of the protective device

NOTE 1 Examples of protective devices are fuses, **overload releases**, thermal fuses, **thermal links**, **thermal cut-outs**, PTC resistors and automatic circuit-breakers.

NOTE 2 In case of protection by a device which cannot be replaced nor re-set, the wording "continues to meet all requirements of this standard after removal of the overload" does not imply that the **reactor** continues to operate.

3.1.105.2**inherently overload proof reactor**

overload proof reactor not equipped with a device to protect the **reactor** and in which the temperature in the case of overload, by construction, does not exceed the specified limits and which continues to operate and meet all the requirements of this standard after the removal of the overload

3.1.106**non-overload proof reactor**

reactor which is intended to be protected against excessive temperature by means of a protective device not provided with the **reactor** and which continues to meet all the requirements of this standard after the removal of the overload and resetting or replacing of the protective device

3.1.107**fail-safe reactor**

reactor which, after abnormal use, permanently fails to function by an interruption of the failing circuit but presents no danger to the user or surroundings

Replacement:

3.4 Circuits and windings

This subclause of part 1 is not applicable.

3.5 Ratings

This subclause of part 1 is applicable except as follows:

Replacement:

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3.5.4**rated current**

rated current, assigned to the **reactor** by the manufacturer including harmonics, if any, which influence the heating of the **reactor**

Addition:

3.5.101**rated power**

sum of the products of the **rated voltage drop** and the **rated current** at **rated frequency** for the different windings

3.5.102**rated inductance**

inductance of the **reactor** designed by the manufacturer for the specified operating condition of the **reactor**

NOTE The specific operating conditions of d.c. **reactors** are determined by the d.c. component and the superimposed a.c. component.

3.5.103**rated resistance**

d.c. resistance of a winding of a **reactor** designed by the manufacturer for the specified operating conditions of the **reactor**

3.5.104**rated voltage drop**

voltage across a winding of the **reactor** at **rated current** and **rated frequency** assigned by the manufacturer