
Auxiliaries for lamps - A.C. supplied electronic ballasts for tubular fluorescent lamps - General requirements (IEC 928:1995)

Auxiliaries for lamps - A.C. supplied electronic ballasts for tubular fluorescent lamps - General and safety requirements

Geräte für Lampen - Wechselstromversorgte elektronische Vorschaltgeräte für röhrenförmige Leuchtstofflampen - Allgemeine und Sicherheitsanforderungen

Appareils auxiliaires pour lampes - Ballasts électroniques alimentés en courant alternatif pour lampes tubulaires à fluorescence - Prescriptions générales et prescriptions de sécurité

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Ta slovenski standard je istoveten z: EN 60928:1995

ICS:

29.140.30 Fluorescent lamps.
Discharge lamps

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EUROPEAN STANDARD
NORME EUROPÉENNE
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May 1995

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Descriptors: Lighting equipment, tubular lamp, fluorescent lamp, electric ballast, alternative current, safety requirement

English version

Auxiliaries for lamps
A.C. supplied electronic ballasts for tubular fluorescent lamps
General and safety requirements
(IEC 928:1995)

Appareils auxiliaires pour lampes
Ballasts électroniques alimentés en
courant alternatif pour lampes tubulaires
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de sécurité
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anforderungen
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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 34C/279/DIS, future amendment to IEC 928:1990, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote.

The text of this document, together with that of IEC 928:1990 and its amendments 1:1992 and 2:1993, was published by IEC as the second edition of IEC 928 in February 1995 and was approved by CENELEC as EN 60928:1991 on 1995-05-15.

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) 1996-02-15
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1996-02-15

For products which have complied with EN 60928:1991 and its amendment A2:1994 before 1996-02-15, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 2001-02-15.

Annexes designated "normative" are part of the body of the standard. In this standard, annexes A, B, C, D and ZA are normative. Annex ZA has been added by CENELEC.

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The text of the International Standard IEC 928:1995 was approved by CENELEC as a European Standard without any modification.

Annex ZA (normative)

Normative references to international publications
with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 81	1984	Tubular fluorescent lamps for general lighting service	EN 60081 ¹⁾	1989
IEC 112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
IEC 249	series	Base materials for printed circuits	EN 60249	series
IEC 317	series	Specifications for particular types of winding wires	HD 555 EN 60317	series series
IEC 417C	1977	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S12 ²⁾	1995
IEC 479	series	Effects on current passing through the human body	-	-
IEC 529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529 + corr. May 1993	1991
IEC 598-1 (mod)	1992	Luminaires Part 1: General requirements and tests	EN 60598-1	1993
IEC 598-2-22 (mod)	1990	Part 2: Particular requirements Section 22: Luminaires for emergency lighting	EN 60598-2-22	1990

1) EN 60081 includes A1:1987 + A2:1988 to IEC 81.

2) HD 243 S12 is based on IEC 417:1973 and its supplements A:1974 to M:1994.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 664-3	1992	Insulation coordination for equipment within low-voltage systems Part 3: Use of coatings to achieve insulation coordination of printed board assemblies	-	-
IEC 691	1993 ³⁾	Thermal-links Requirements and application guide	-	-
IEC 695-2-1	1991 ⁴⁾	Fire hazard testing Part 2: Test methods Section 1: Glow-wire test and guidance	-	-
IEC 695-2-2	1991	Section 2: Needle-flame test	EN 60695-2-2	1994
IEC 730-2-3 (mod)	1990	Automatic electrical controls for household and similar use Part 2: Particular requirements for thermal protectors for ballasts for tubular fluorescent lamps	EN 60730-2-3	1992
IEC 901	1987	Single-capped fluorescent lamps Safety and performance requirements	EN 60901	1990
IEC 920	1990	Ballast for tubular fluorescent lamps General and safety requirements	EN 60920	1991
IEC 929	1990	A.C. supplied electronic ballasts for tubular fluorescent lamps Performance requirements	EN 60929	1992
IEC 990	1990	Methods of measurement of touch-current and protective conductor current	-	-
ISO 4046	1978	Paper, board, pulp and related terms Vocabulary	-	-

3) IEC 691:1980 is harmonized as EN 60091:1987 + corr. May 1992.

4) IEC 695-2-1:1980 is harmonized as HD 444.2.1 S1:1983.

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Deuxième édition
Second edition
1995-02

Appareils auxiliaires pour lampes –
Ballasts électroniques alimentés en courant
alternatif pour lampes tubulaires à fluorescence

Prescriptions générales et prescriptions de sécurité

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General and safety requirements

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUXILIARIES FOR LAMPS –
A.C. SUPPLIED ELECTRONIC BALLASTS FOR
TUBULAR FLUORESCENT LAMPS**

GENERAL AND SAFETY REQUIREMENTS

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international cooperation 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 Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, prepared by technical committees on which all the National Committees having a special interest therein are represented, express, as nearly as possible, an international consensus of opinion on the subjects dealt with.
- 3) They have the form of recommendations for international use published in the form of standards, 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.

International Standard IEC 928 has been prepared by sub-committee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 1990, amendment 1, published in 1992, and amendment 2, published in 1993, and constitutes a technical revision.

The text of this standard is based on the first edition, amendments 1 and 2 and the following documents:

DIS	Report on voting
34C/279/DIS	34C/298/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.

Annexes A, B, C and D form an integral part of this standard.

In this standard the following print types are used:

- Requirements proper: in roman type.
- *Test specifications: in italic type.*
- Notes: in smaller roman type.
- Words in **bold** in the text are defined in clause 3.

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INTRODUCTION

This standard covers general and safety requirements for a.c. supplied electronic ballasts for tubular fluorescent lamps generally operating with a frequency deviating from the supply frequency. Described ballasts may operate with a.c./d.c. supply in maintained emergency lighting luminaires.

This standard refers to a.c. and a.c./d.c. supplied electronic ballasts for use with high-frequency operated tubular fluorescent lamps as specified in IEC 81 and IEC 901 (except for lamps with internal starters) and other tubular fluorescent lamps for high-frequency operation.

Performance requirements are the subject of IEC 929.

NOTE - Safety requirements ensure that electric equipment constructed in accordance with these requirements does not endanger the safety of persons, domestic animals or property, when properly installed and maintained and used in applications for which it was intended.

Requirements for supply current waveform regarding all types of ballasts are presently being considered by specialist panels. Pending the outcome of these considerations, such requirements are not yet specified.

Requirements for electronic ballasts for other types of discharge lamps will be the subject of a separate standard, as need arises.

Tests in this standard are type tests. Requirements for testing individual ballasts during production are not included.

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AUXILIARIES FOR LAMPS – A.C. SUPPLIED ELECTRONIC BALLASTS FOR TUBULAR FLUORESCENT LAMPS

GENERAL AND SAFETY REQUIREMENTS

Section 1: General requirements

1 Scope

This standard specifies general and safety requirements for electronic ballasts for use on a.c. supplies up to 1 000 V at 50 Hz or 60 Hz with operating frequencies deviating from the supply frequency, associated with tubular fluorescent lamps as specified in IEC 81 and other tubular fluorescent lamps for high-frequency operation.

Particular requirements for electronic ballasts with means of protection against overheating are given in annex B.

Particular requirements for a.c./d.c. supplied electronic ballasts for maintained emergency lighting are given in annex C.

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2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 81: 1984, *Tubular fluorescent lamps for general lighting service*

IEC 112: 1979, *Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions*

IEC 249: *Base materials for printed circuits*

IEC 317: *Specifications for particular types of winding wires*

IEC 417C: 1977, *Graphical symbols for use on equipment – Index, survey and compilation of the single sheets – Third supplement*

CEI 479, *Effects of current passing through the human body*

IEC 529: 1989, *Degrees of protection provided by enclosures (IP code)*

IEC 598-1: 1992, *Luminaires – Part 1: General requirements and tests*

IEC 598-2-22: 1990, *Luminaires – Part 2: Particular requirements – Section twenty-two – Luminaires for emergency lighting*