

Lamp controlgear —

Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps

ICS 29.140.99

National foreword

This British Standard is the UK implementation of EN 61347-2-2:2001+A2:2006, including corrigenda July 2003, November 2006 and December 2010. It is identical with IEC 61347-2-2:2000 including amendments 1:2005 and 2:2006. Together with BS EN 61347-1:2001 it supersedes BS EN 61046:1995 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated in the text by **A1** **A1**.

The UK participation in its preparation was entrusted by Technical Committee CPL/34, Lamps and related equipment, to Subcommittee CPL/34/3, Auxiliaries for lamps.

A list of organizations represented on CPL/34/3 can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Amendments/corrigenda issued since publication

Amd. No.	Date	Comments
14670 Corrigendum No. 1	26 September 2003	Change to date of withdrawal in foreword
16324	31 May 2006	See national foreword
16530	29 September 2006	See national foreword
16836 Corrigendum No. 2	31 January 2007	Change to EN foreword and Annex ZA
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**Lamp controlgear —
Part 2-2: Particular requirements for d.c. or a.c. supplied
electronic step-down convertors for filament lamps
(IEC 61347-2-2:2000)**

Appareillages de lampes —
Partie 2-2: Prescriptions particulières
pour les convertisseurs abaisseurs
électroniques alimentés en courant
continu ou alternatif pour lampes à
incandescence
(CEI 61347-2-2:2000)

Geräte für Lampen —
Teil 2-2: Besondere Anforderungen an
gleich- oder wechselstromversorgte
elektronische Konverter für Glühlampen
(IEC 61347-2-2:2000)

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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.

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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/499/FDIS, future edition 1 of IEC 61347-2-2, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61347-2-2 on 2000-11-01.

This European Standard, together with EN 61347-1, supersedes EN 61046:1994 + A1:1996.

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) 2001-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2006-12-01

This standard shall be used in conjunction with EN 61347-1.

NOTE In this standard, the following print types are used:

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

Annexes designated "normative" are part of the body of the standard.

In this standard, annexes A to F, H, I and ZA are normative and annex G is informative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61347-2-2:2000 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A1

The text of document 34C/701/FDIS, future amendment 1 to IEC 61347-2-2:2000, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 61347-2-2:2001 on 2006-02-01.

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- latest date by which the national standards conflicting
with the amendment have to be withdrawn (dow) 2009-02-01

This European Standard makes reference to International Standards. Where the International Standard referred to has been endorsed as a European Standard or a home-grown European Standard exists, this European Standard shall be applied instead. Pertinent information can be found on the CENELEC web site.

Endorsement notice

The text of amendment 1:2005 to the International Standard IEC 61347-2-2:2000 was approved by CENELEC as an amendment to the European Standard without any modification.

Foreword to amendment A2

The text of document 34C/729/FDIS, future amendment 2 to IEC 61347-2-2:2000, prepared by SC 34C, Auxiliaries for lamps, of IEC TC 34, Lamps and related equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 61347-2-2:2001 on 2006-06-01.

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Endorsement notice

The text of amendment 2:2006 to the International Standard IEC 61347-2-2:2000 was approved by CENELEC as an amendment to the European Standard without any modification.

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INTRODUCTION

This first edition of IEC 61347-2-2, published in conjunction with IEC 61347-1, represents an editorial review of IEC 61046. The formatting into separately published parts provides for ease of future amendments and revisions. Additional requirements will be added as and when a need for them is recognized.

This standard, and the parts which make up IEC 61347-2, in referring to any of the clauses of IEC 61347-1, specify the extent to which such a clause is applicable and the order in which the tests are to be performed; they also include additional requirements, as necessary. All parts which make up IEC 61347-2 are self-contained and, therefore, do not include references to each other.

Where the requirements of any of the clauses of IEC 61347-1 are referred to in this standard by the phrase "The requirements of clause n of IEC 61347-1 apply", this phrase is interpreted as meaning that all requirements of the clause in question of part 1 apply, except any which are clearly inapplicable to the specific type of lamp controlgear covered by this particular part of IEC 61347-2.

LAMP CONTROLGEAR –

Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps

1 Scope

This part of IEC 61347 specifies particular safety requirements for electronic step-down convertors for use on d.c. supplies up to 250 V or a.c. supplies up to 1 000 V at 50 Hz or 60 Hz and rated output voltage ≤ 50 V r.m.s. at a frequency deviating from the supply frequency or $\leq 50\sqrt{2}$ V unsmoothed d.c. between conductors or between any conductor and earth, associated with tungsten-halogen lamps as specified in IEC 60357 and other filament lamps.

NOTE The limit of 50 V rated output voltage is in accordance with band I of IEC 60449.

Particular requirements for electronic step-down convertors with means of protection against overheating are given in annex C.

Particular requirements for stationary independent SELV convertors, which are part of the wiring in installations, are given in annex I.

Performance requirements are covered by IEC 61047.

Plug-in convertors, being part of the luminaire, are covered as for built-in convertors by the additional requirements of the luminaire standard.

2 Normative references

For the purpose of this part of IEC 61347, the normative references given in clause 2 of IEC 61347-1 which are mentioned in this standard apply, together with the following normative references.

IEC 60051 (all parts), *Direct acting indicating analogue electrical measuring instruments and their accessories*

IEC 60065, *Safety requirements for mains operated electronic and related apparatus for household and similar general use*

IEC 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

IEC 60085, *Thermal evaluation and classification of electrical insulation*

IEC 60127 (all parts), *Miniature fuses*

IEC 60269-2, *Low-voltage fuses – Part 2: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application)*

IEC 60269-2-1, *Low-voltage fuses – Part 2-1: Supplementary requirements for fuses for use by authorized persons (fuses mainly for industrial application) – Sections I to V: Examples of types of standardized fuses*

IEC 60269-3:1987, *Low-voltage fuses – Part 3: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications)*

IEC 60269-3-1, *Low-voltage fuses – Part 3-1: Supplementary requirements for fuses for use by unskilled persons (fuses mainly for household and similar applications) – Sections I to IV*

IEC 60357, *Tungsten-halogen lamps (non-vehicle)*

IEC 60364-4-41, *Electrical installations of buildings – Part 4: Protection for safety – Chapter 41: Protection against electric shock*

IEC 60449, *Voltage bands for electrical installations of buildings*

IEC 60454 (all parts), *Specifications for pressure-sensitive adhesive tapes for electrical purposes*

IEC 60598-2-6, *Luminaires – Part 2: Particular requirements – Section 6: Luminaires with built-in transformers for filament lamps*

IEC 60742:1983, *Isolating transformers and safety isolating transformers – Requirements Amendment 1 (1992)*

IEC 60906 (all parts), *IEC system of plugs and socket-outlets for household and similar purposes*

IEC 60906-1, *IEC system of plugs and socket-outlets for household and similar purposes – Part 1: Plugs and socket-outlets 16 A 250 V a.c.*

IEC 61047, *DC or a.c. supplied electronic step-down convertors for filament lamps – Performance requirements*

IEC 61347-1, *Lamp controlgear – Part 1: General and safety requirements*

Ⓐ IEC 60384-14:2005, *Fixed capacitors for use in electronic equipment – Part 14: Fixed capacitors for electromagnetic interference suppression and connection to the supply mains* Ⓐ

3 Definitions

For the purpose of this part of IEC 61347, the definitions given in clause 3 of IEC 61347-1 apply, together with the following:

3.1

electronic step-down convertor (convertor)

unit inserted between the supply and one or more tungsten-halogen or other filament lamps which serves to supply the lamp(s) with its (their) rated voltage, generally at high frequency. The unit may consist of one or more separate components and may include means for dimming, correcting the power factor and suppressing radio interference

3.2

d.c. or a.c. supplied convertor

convertor that includes stabilizing elements for operating one or more filament lamps, generally at high frequency

3.3

safety extra-low voltage (SELV)-equivalent convertor

built-in or associated convertor for operating one or more filament lamps with an output voltage equivalent to a SELV

NOTE For the purposes of this standard, SELV-equivalent convertors, complying with 8.1 and 8.2 are deemed as giving protection against electric shock equivalent to SELV.

3.4

independent SELV convertor

convertor providing a SELV output isolated from the supply mains by means such as a safety isolating transformer, as specified in IEC 60742

3.5

associated convertor

convertor designed to supply specific appliances or equipment, incorporated or not incorporated, but specially designed to be used only with the specific appliance(s) or equipment

3.6

stationary convertor

either a fixed convertor or one which cannot be easily moved from one place to another

3.7

plug-in convertor

convertor incorporated in an enclosure provided with an integral plug as the means of connection of the electrical supply

3.8

rated output voltage

output voltage, at rated supply voltage, rated frequency and at unity power factor, assigned to the convertor

3.9

half-resistance effect

effect which can occur at the end of lamp life due to filament deformation or crystallization effects resulting in a partial short-circuit of the lamp filament, which can cause overloading of the convertor

3.10

arcing

effect which can occur in lamps at a voltage of ≥ 20 V and which can cause overloading of the convertor

4 General requirements

The requirements of clause 4 of IEC 61347-1 apply, together with the following additional requirement:

Independent SELV convertors shall comply with the requirements of annex I. This includes insulation resistance, electric strength, creepage distances and clearances of the outer case.

5 General notes on tests

The requirements of clause 5 of IEC 61347-1 apply, with the following additional requirement:

Number of specimens

The following number of specimens shall be submitted for testing:

- one unit for the tests of clauses 6 to 12 and 15 to 21;
- one unit for the tests of clause 14 (additional units or components, where necessary, may be required in consultation with the manufacturer).

[A1] Unless otherwise declared by the manufacturer, the tests are carried out with the length of the output wire or cable either 20 cm or 200 cm, choosing the most unfavourable condition. It is possible to use two twisted wires or cable H03VV-. The cross section of the conductors shall be chosen according to the rated wattage and the current density shall not exceed 5 A/mm² in normal use. **[A1]**

6 Classification

Convertors are classified according to the method of installation given in clause 6 of IEC 61347-1 and according to:

Protection against electric shock

- SELV-equivalent or isolating convertors (this type of convertor can be used instead of double-wound transformers with reinforced insulation; see IEC 60598-2-6);
- auto-wound convertors;
- independent SELV convertors.

7 Marking

7.1 Mandatory marking

Convertors, other than integral convertors, shall be clearly and durably marked, in accordance with the requirements of 7.2 of IEC 61347-1, with the following mandatory markings:

- items a), b), c), d), e), f), k), l), m) of 7.1 of IEC 61347-1 together with
- rated output voltage.

7.2 Information to be provided if applicable

In addition to the above mandatory markings, the following information, if applicable, shall be given either on the convertor, or be made available in the manufacturer's catalogue or similar:

- items h), i), and j) of 7.1 of IEC 61347-1 together with
- mention whether the convertor has mains-connected windings,
- mention that they are SELV-equivalent convertors, if applicable.
- **[A1]** a declaration of the allowed length of the output wire or cable, if it is not between 20 cm and 200 cm. **[A1]**

8 Protection against accidental contact with live parts

The requirements of clause 10 of IEC 61347-1 apply, together with the following additional requirements:

8.1

For SELV-equivalent convertors, the accessible parts shall be insulated from live parts by double or reinforced insulation.

Subclauses 9.3.4 and 9.3.5 of IEC 60065 shall apply.

8.2

Output circuits of SELV-equivalent convertors may have exposed terminals if

- the rated output voltage under load does not exceed 25 V r.m.s.;
- the no-load output voltage does not exceed 33 V r.m.s. or $33\sqrt{2}$ V peak or $33\sqrt{2}$ V unsmoothed d.c.

Compliance is checked by measuring the output voltage when steady conditions are established, the convertor being connected to rated supply voltage and rated frequency. For the test under load, the convertor is loaded with a resistance which would give rated output at rated output voltage.

For convertors with more than one rated supply voltage, the requirement is applicable for each of the rated supply voltages.

NOTE The limit of 25 V r.m.s. is based on IEC 60364-4-41.

Convertors with a rated output voltage above 25 V shall have insulated terminals.

A1 In the case of capacitors which are connected between SELV-equivalent output and primary circuits, one capacitor Y1 or two capacitors Y2 in series with the same value specified and tested according to Tables 2 and 3 respectively of IEC 60384-14 are to be used. **A1**

In the case of resistors which are connected to SELV-equivalent output and primary circuits, two resistors in series with the same value shall be used.

If other components are necessary for bridging the separating transformer, for example resistors, clause 14 of IEC 60065 shall apply.

8.3

Convertors incorporating capacitors of a total capacitance exceeding 0,5 μ F shall be constructed so that the voltage at the convertor terminations does not exceed 50 V, 1 min after disconnection of the convertor from a source of supply at rated voltage.