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D.C. or a.c. supplied electronic step-down convertors for filament lamps -  
performance requirements (IEC 61047:1991)

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Descriptors: Electronic equipment, convertor, filament lamp, halogen lamp, classification, marking, temperature shock test, test requirement

English version

## D.C. or a.c. supplied electronic step-down convertors for filament lamps — Performance requirements

(IEC 1047 : 1991)

Convertisseurs abaisseurs électroniques  
alimentés en courant continu ou alternatif  
pour lampes à incandescence  
Prescriptions de performances  
(CEI 1047 : 1991)

Gleich- oder wechselstromversorgte  
elektronische Konverter für Glühlampen —  
Anforderungen an die Arbeitsweise  
(IEC 1047 : 1991)

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This European Standard was approved by CENELEC on 1992-09-15. 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, 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

At the request of the CENELEC Technical Committee TC 34Z, Luminaires and association equipment, the International Standard IEC 1047 : 1991 was submitted to the CENELEC Unique Acceptance Procedure (UAP) in November 1991 for acceptance as a European Standard.

The text of the International Standard was approved by CENELEC as EN 61047 on 15 September 1992.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1993-09-01
- latest date of withdrawal of conflicting national standards (dow) 1993-09-01

Annexes designated 'normative' are part of the body of the standard. In this standard, annex ZA is normative.

For products which have complied with the relevant national standard before 1993-09-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-09-01.

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## INTRODUCTION

This International Standard covers performance requirements for electronic step-down convertors for d.c. supplies up to 250 V and a.c. supplies up to 1 000 V at 50 Hz or 60 Hz, operating with controlled voltage filament lamps at frequencies deviating from the supply frequency.

Attention is drawn to the fact that operating frequencies below 20 kHz may cause audio noise.

NOTE - Regarding radio interference, CISPR requirements have to be observed in some countries.

In order to obtain satisfactory performance of filament lamps and electronic convertors, it is necessary that certain features of their designs be properly coordinated.

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## D.C. OR A.C. SUPPLIED ELECTRONIC STEP-DOWN CONVERTORS FOR FILAMENT LAMPS

### Performance requirements

#### 1 Scope and normative references

##### 1.1 Scope

This International Standard specifies performance requirements for electronic step-down convertors for use on d.c. supplies up to 250 V and a.c. supplies up to 1 000 V at 50 Hz or 60 Hz with operating frequencies deviating from the supply frequency, associated with tungsten halogen lamps as specified in IEC 357 and other filament lamps.

##### NOTES

- 1 The tests in this standard are type tests. Requirements for testing individual convertors during production are not included.
- 2 Requirements for convertors which incorporate means for varying the lamp power are under consideration.
- 3 It may be expected that convertors complying with this standard will ensure satisfactory operation between 92 % and 106 % of rated supply voltage of filament lamps with rated lives greater than 200 hours and rated voltage less than 50 V.

This standard is to be read in conjunction with IEC 1046.

##### 1.2 Normative references

The following standards contain provisions which, through reference in the text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards 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 standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 357: 1982, *Tungsten halogen lamps (non-vehicle). Amendment No. 1 (1984), Amendment No. 2 (1985), Amendment No. 3 (1987), Amendment No. 4 (1989).*

IEC 410: 1973, *Sampling plans and procedures for inspection by attributes.*

IEC 555-2: 1982, *Disturbances in supply systems caused by household appliances and similar electrical equipment. Part 2: Harmonics.*

IEC 1046: 1991, *D.C. or a.c. supplied electronic step-down convertors for filament lamps. General and safety requirements.*

## 2 Definitions

For the purpose of this International Standard the following definitions apply:

**2.1 total circuit power:** The total power dissipated by convertor and lamp(s) in combination, at rated supply voltage of the convertor and at the highest rated output load.

**2.2 circuit power factor:** symbol  $\lambda$ : The circuit power factor is the ratio of measured circuit power to the product of the supply voltage (r.m.s.) and the supply current (r.m.s.).

**2.3 high power factor convertor:** A convertor having a circuit power factor of at least 0,85\*.

\*For North America a high power factor is defined as a power factor of at least 0,9.

NOTE - The value of the power factor takes into account the effect of the distortion of the current waveform.

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**2.4 high audio-frequency impedance convertor:** A convertor the impedance of which in the frequency range 250 Hz to 2 000 Hz exceeds the values specified in clause 10 of this standard.

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**2.5 short-circuit proof convertor:** A convertor which remains capable of functioning after an incidental overload or short circuit is removed and after restoration of a protecting device, if any.

## 3 General notes on tests

**3.1 The tests according to this standard are type type tests.**

NOTE - The requirements and tolerances permitted by this standard are based on testing of a type test sample submitted by the manufacturer for that purpose. In principle this type test sample should consist of units having characteristics typical of the manufacturer's production and be as close to the production centre point values as possible.

It may be expected with the tolerances given in the standard that products manufactured in accordance with the type test sample will comply with the standard for the majority of the production. Due to the production spread however, it is inevitable that there will sometimes be products outside the specified tolerances. For guidance of sampling plans and procedures for inspection by attributes, see IEC 410.

**3.2 For tests which are carried out with a lamp or lamps, this lamp(s) shall fulfill the following requirements:**

The wattage of the lamp(s) when measured at its rated lamp voltage (d.c. or a.c. 50 Hz/60 Hz) shall not differ from the rated wattage by more than +6 % and -0 %.

**3.3 The tests shall be carried out in the order of the clauses, unless otherwise specified.**



3.4 One specimen shall be submitted to all the tests.

3.5 In general all the tests are made on each type of convertor or, where a range of similar convertors is involved for each rated wattage in the range or on a representative selection from the range as agreed with the manufacturer.

3.6 The tests shall be made under the conditions specified in Appendix A. Data of lamps not published in an IEC Standard shall be made available by the lamp manufacturer.

3.7 All convertors covered by this Standard shall comply with the requirements of IEC 1046.

## 4 Classification

### 4.1 Classification according to the load

a) Single value load convertors.

This type of convertor is designed for use with one specific output wattage only, which may be dissipated by one or more lamps.

b) Multiple value load convertor

This type of convertor is designed for use with one or more lamps with a total load within the declared wattage range.

### 4.2 Classification according to output voltage

a) Convertors having a stabilized output voltage

b) Convertors without a stabilized output voltage

## 5 Marking

### 5.1 Mandatory marking

5.1.1 Convertors shall be clearly marked as follows:

a) Circuit power factor; e.g.  $\lambda = 0,9$

If the power factor is less than 0,95 leading, it shall be followed by the letter "C", e.g.  $\lambda = 0,9 C$ .

b) If applicable:

The symbol H which indicates that the convertor is not of the low distortion type.