

**SLOVENSKI STANDARD**  
**SIST EN 61050:1996****01-junij-1996**

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**Transformatorji za cevaste sijalke z napetostjo praznega teka nad 1000 V (v splošnem imenovani neonski transformatorji) - Splošne in varnostne zahteve (IEC 61050:1991 + Corrigendum 1992, spremenjen)**

Transformers for tubular discharge lamps having a no-load output voltage exceeding 1 kV (generally called neon-transformers) - General and safety requirements

Transformatoren mit einer Leerspannung über 1 kV für Leuchtröhren (allgemein Neontransformatoren genannt) - Allgemeine und Sicherheits-Anforderungen

Transformateurs pour lampes tubulaires à décharge ayant une tension secondaire à vide supérieure à 1 kV (couramment appelés transformateurs-néon) - Prescriptions générales et de sécurité

**Ta slovenski standard je istoveten z: EN 61050:1992**

**ICS:**

29.140.30	Fluorescenčne sijalke. Sijalke	Fluorescent lamps. Discharge lamps
29.180	Transformatorji. Dušilke	Transformers. Reactors

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Supersedes HD 388 S2:1983

Descriptors: Lighting equipment, electric lamp, discharge lamp, tubular lamp, transformer, classification, safety requirement, electrical property, degree of protection, marking

## ENGLISH VERSION

Transformers for tubular discharge lamps having a no-load output voltage exceeding 1000 V (generally called neon-transformers)  
General and safety requirements  
(IEC 1050:1991 + Corrigendum March 1992, modified)

Transformateurs pour lampes tubulaires à décharge ayant une tension secondaire à vide supérieure à 1000 V (couramment appelés transformateurs-néon)  
Prescriptions générales et de sécurité  
(CEI 1050:1991 + corrigendum mars 1992, modifiée)

Transformatoren mit einer Leerspannung über 1000 V für Leuchtröhren  
(allgemein Neontransformatoren genannt)  
Allgemeine und Sicherheitsanforderungen  
(IEC 1050:1991 + Corrigendum März 1992, modifiziert)

STANDARD PREVIEW  
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This European Standard was approved by CENELEC on 1992-03-24. 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 secretary of CENELEC Technical Committee TC 34Z, Luminaires and associated equipment, the International Standard IEC 1050:1991 was submitted to the CENELEC Unique Acceptance Procedure (UAP) in June 1991 for acceptance as a European Standard.

The reference document and its corrigendum March 1992, together with some common modifications agreed by 71 Technical Board, were approved by CENELEC as EN 61050 on 24 March 1992.

EN 61050 supersedes HD 388 S2:1983.

The following dates were fixed:

- latest date of publication of  
an identical national standard (dop) 1993-03-01
- latest date of withdrawal of  
conflicting national standards (dow) 1993-03-01

For products which have complied with HD 388 S2:1983 before 1993-03-01, as shown by the manufacturer or by a certification body, this previous standard may continue to apply for production until 1998-03-01.

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

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ENDORSEMENT NOTICE

The text of the International Standard IEC 1050:1991 and its corrigendum March 1992 was approved by CENELEC as a European Standard with agreed common modifications as given below.

## COMMON MODIFICATIONS

1.1 Scope

Delete the note after the first paragraph.

6 Classification

Add new subclause 6.3:

6.3 Transformers are classified according to whether or not open-circuit protective devices and/or earth-leakage protective devices (see 6.2b) are built into the transformer.

Annex A Information on wiring rules

In table A1:

- in the first column, add 'CH' to 'DE'.
- delete the data relevant to Japan [JP] and USA [US].

Delete the notes under table A1 referring to Japan.

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## ANNEX ZA (normative)

OTHER INTERNATIONAL PUBLICATIONS QUOTED IN THIS STANDARD  
WITH THE REFERENCES OF THE RELEVANT EUROPEAN PUBLICATIONS

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

IEC Publication	Date	Title	EN/HD	Date
112	1979	Method for determining the comparative and the proof tracking indices of solid insulating materials under moist conditions	HD 214 S2	1980
417	1973	Graphical symbols for use on equipment Index, survey and compilation of the single sheets	HD 243 S1*	1973
529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
598-1 (mod) + A1	1986 1988	Luminaires - Part 1: General requirements and tests	EN 60598-1	1989
695-2-1	1980	Fire hazard testing - Part 2: Test methods - Glow-wire test and guidance	HD 444.2.1 S1	1983
817	1984	Spring-operated impact-test apparatus and its calibration	HD 495 S1	1987
1048	1990	Capacitors for use in tubular fluorescent and other discharge lamp circuits - General and safety requirements (Corrigendum 1992)	-	-

## Other publication

ISO 3: 1973 - Preferred numbers - Series of preferred numbers

\* Superseded by HD 243 S9:1991 which is based on IEC 417:1973 + supplements A:1974 to J:1990

NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD

CEI  
IEC  
1050

Première édition  
First edition  
1991-02

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**Transformateurs pour lampes tubulaires  
à décharge ayant une tension secondaire  
à vide supérieure à 1 000 V  
(couramment appelés transformateurs-néon)**

Prescriptions générales et de sécurité

**Transformers for tubular discharge lamps having  
a no-load output voltage exceeding 1 000 V  
(generally called neon-transformers)**

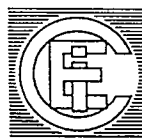
General and safety requirements

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International Electrotechnical Commission  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

TRANSFORMERS FOR TUBULAR DISCHARGE LAMPS  
HAVING A NO-LOAD OUTPUT VOLTAGE EXCEEDING 1 000 V

(generally called neon-transformers)

## General and safety requirements

## FOREWORD

- 1) 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.
- 2) They have the form of recommendations for international use and they are accepted by the National Committees in that sense.
- 3) In order to promote international unification, the IEC expresses the wish that all National Committees should adopt the text of the IEC recommendation for their national rules in so far as national conditions will permit. Any divergence between the IEC recommendation and the corresponding national rules should, as far as possible, be clearly indicated in the latter.
- 4) The IEC has not laid down any procedure concerning marking as an indication of approval and has no responsibility when an item of equipment is declared to comply with one of its recommendations.

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This International Standard has been prepared by Sub-Committee 34C: Auxiliaries for discharge lamps, of IEC Technical Committee No. 34: Lamps and related equipment. It constitutes the first edition of IEC 1050.

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

Six Months' Rule	Reports on Voting
34C(C0)176 34C(C0)187	34C(C0)185 34C(C0)197

Full information on the voting for the approval of this standard can be found in the Voting Reports indicated in the above table.

In this standard, the following print types are used:

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

Annexes A, B and C form an integral part of IEC 1050.

TRANSFORMERS FOR TUBULAR DISCHARGE LAMPS  
HAVING A NO-LOAD OUTPUT VOLTAGE EXCEEDING 1 000 V  
(generally called neon-transformers)

General and safety requirements

SECTION 1: GENERAL REQUIREMENTS

1 General

1.1 Scope

This International Standard is applicable to independent and built-in single-phase transformers with separate input and output windings, for use on a.c. supply up to 1 000 V at 50 Hz or 60 Hz, to supply and stabilize cold cathode tubular lamps (or assemblies of such lamps) having a no-load rated output voltage exceeding 1 000 V but not exceeding 10 000 V (see notes 1 and 2) and intended for lighting and for electric advertising signs, light signals and similar purposes.

NOTE - Different requirements apply in Japan and North America, which will be the subject of a future annex to this standard.

In order to ensure the safety of these transformers, it is necessary to check their performance. But since no standardization of the characteristics of these lamps exists, reference loads are defined in this standard to ensure reproducible test results.

In locations where special conditions prevail, as in ships, vehicles and the like, and in dangerous locations, for example, where explosions are liable to occur, special constructions may be required.

This standard does not apply to transformers intended for the supply of lamps or tubes such as low-pressure or high-pressure sodium vapour lamps, high-pressure mercury vapour lamps, halogen lamps, xenon lamps, hot cathode tubular fluorescent lamps, special lamps for document copying machines, etc.

This standard does not apply to auto-transformers and electronic converters.

This standard may, nevertheless, serve as a guide for transformers with applications other than those specified in the scope, for instance transformers for photographic lamps, as long as their characteristics remain within the framework of those specified in the scope and they are not the subject of a particular IEC standard.

Capacitors shall comply with IEC 1048, where applicable.

## NOTES

1 See definition of 2.9

2 Other limits may be specified in national standards or wiring rules, see annex A.

Tests in this standard are type tests. Guidance on routine testing is given in annex C.

## 1.2 Normative references

The following standards 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 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 standards

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

IEC 417: 1973, *Graphical symbols for use on equipment. Index, survey and compilation of the single sheets.*

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

IEC 598-1: 1986, *Luminaires - Part 1: General requirements and tests. Amendment No. 1 (1988).*

IEC 695-2-1: 1980, *Fire hazard testing - Part 2: Test methods. Glow-wire test and guidance.*

IEC 817: 1984, *Spring-operated impact-test apparatus and its calibration.*

IEC 1048: 1990, *Capacitors for use in tubular fluorescent and other discharge lamp circuits. General and safety requirements.*

### ISO Standard

ISO 3: 1973, *Preferred numbers - Series of preferred numbers.*

## 2 Definitions

Unless otherwise specified, r.m.s. values are implied.

2.1 **rated values:** Values (of voltage, of current, etc.) for which the transformer is constructed and which are indicated by the manufacturer on the nameplate of the transformer.

**2.2 short-circuit current:** Current between output terminals when joined together at rated input voltage and frequency.

**2.3 independent transformer:** Transformer consisting of one or more separate units which can be mounted separately outside a luminaire, without any additional enclosure. This may consist of a built-in transformer housed in a suitable enclosure which provides all the necessary protection according to its marking.

**2.4 built-in transformer:** Transformer consisting of one or more separate units exclusively designed to be built into a luminaire, a box, an enclosure, or the like.

**2.5 short-circuit proof transformer:** Transformer in which the temperature rise does not exceed the specified limits when the transformer is overloaded or short-circuited, and which remains capable of functioning after the overload is removed.

**2.6 inherently short-circuit proof transformer:** Transformer in which the temperature in the case of overload or short-circuit and in the absence of a protective device does not exceed the specified limits and which continues to function after the overload or short-circuit is removed.

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**2.7 tubular cold cathode discharge lamp:** Discharge tube having cathodes which may be coated with an electron emitting material and which during the starting process without external heating, emits electrons by field emission. These lamps have a low-pressure filling of a rare gas (or a mixture of rare gases) and possibly mercury vapour. They can have an inside coating of fluorescent materials.

**2.8 no-load rated output voltage:** Maximum voltage between the terminals of the output winding(s) of the transformer connected to rated supply voltage at rated frequency, with no load on the output circuit. It is the peak value divided by  $\sqrt{2}$ .

**2.9 normal load equivalent resistance:** Non-inductive resistance connected to the output terminals of the transformer which will allow the rated output current to flow in the output winding(s) when the rated supply voltage at rated frequency is applied to the input winding (see figure 1).

**2.10 effective load:** Discharge lamps connected to the output terminals of the transformer which allow the rated output current to flow in the output winding(s) when the rated supply voltage at rated frequency is applied to the input winding.

**2.11 high power factor transformer:** Transformer having an overall power factor of at least 0,85 at 50 Hz or 0,9 at 60 Hz when connected to effective load at rated input voltage and frequency.

2.12 **rated maximum ambient temperature**, symbol  $t_a$ : Temperature assigned to a transformer by the manufacturer to indicate the highest sustained temperature in which the transformer may be operated under normal conditions.

2.13 **rated maximum operating temperature (of a capacitor case)**, symbol  $t_c$ : Highest permissible temperature which may occur at any place on the outer surface of the component under normal operating conditions.

NOTE - The internal losses in a capacitor, though small, will result in the surface temperature being above ambient air temperature and due allowance for this should be made. The temperature difference will depend upon the nature of the enclosure.

2.14 **rated maximum operating temperature (of a winding)**, symbol  $t_w$ : Winding temperature assigned by the manufacturer as the highest declared winding temperature which gives the transformer an expectancy of five years continuous operation at that temperature.

2.15 **rated temperature rise (of a winding)**, symbol  $\Delta t$ : Temperature rise assigned by the manufacturer to the winding under the specified conditions.

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NOTE - See clause 10 for heating test.

2.16 **working voltage**: Highest r.m.s. voltage which may occur across any insulation, transients being neglected, in open-circuit conditions or during lamp operation, when the transformer is supplied at its rated voltage.

2.17 **detachable part**: Part which can be removed only by hand, without the use of a tool, coin or any other object.

2.18 **type test**: Test, or a series of tests, made on a type test sample for the purpose of checking compliance of the design of a given product with the requirements of the relevant specification.

2.19 **type test sample**: Sample consisting of one or more similar units submitted by the manufacturer or the responsible vendor for the purpose of a type test.

### 3 General requirements

Transformers shall be so designed and constructed that in normal use they operate without danger to the user or surroundings. Capacitors and other components incorporated in transformers shall comply with the requirements of the appropriate IEC standards.