



# SLOVENSKI STANDARD

## SIST EN 60927:2000

01-junij-2000

Nadomešča:  
SIST EN 60927:1995

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### Auxiliaries for lamps - Starting devices (other than glow starters) - Performance requirements

Auxiliaries for lamps - Starting devices (other than glow starters) - Performance requirements

Geräte für Lampen - Startgeräte (andere als Glimmstarter) - Anforderungen an die Arbeitsweise

Appareils auxiliaires pour lampes - Dispositifs d'amorçage (autres que starters à lueur) - Prescriptions de performances

Ta slovenski standard je istoveten z: **EN 60927:1996**

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#### **ICS:**

29.140.30 Fluorescenčne sijalke. Sijalke Fluorescent lamps.  
Discharge lamps

**SIST EN 60927:2000**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60927**

August 1996

ICS 29.140.30

Supersedes EN 60927:1990 and its amendments

Descriptors: Lighting equipment, discharge lamp, fluorescent lamp, tubular lamp, starting device, test

English version

**Auxiliaries for lamps - Starting devices (other than glow starters)  
Performance requirements  
(IEC 927:1996)**

Appareils auxiliaires pour lampes  
Dispositifs d'amorçage (autres que  
starters à lueur) - Prescriptions de  
performance  
(CEI 927:1996)

Geräte für Lampen - Startgeräte  
(andere als Glimmstarter)  
Anforderungen an die Arbeitsweise  
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This European Standard was approved by CENELEC on 1996-07-02. 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

The text of document 34C/330/FDIS, future amendment to IEC 927:1988, 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 an amendment to EN 60927:1990 on 1996-07-02.

The text of this document, together with that of IEC 927:1988 and its amendments 1:1990 and 2:1995, was published by IEC as the second edition of IEC 927 in June 1996. According to a decision of principle taken by the Technical Board of CENELEC, the approval of this amendment has been converted into the approval of a new EN 60927.

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) 1997-04-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 1997-04-01

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

Annexes designated "informative" are given for information only.

In this standard, annexes A and ZA are normative and annexes B and C are informative.

Annex ZA has been added by CENELEC.

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#### Endorsement notice

The text of the International Standard IEC 927:1996 was approved by CENELEC as a European Standard without any modification.

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## 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 <sup>1)</sup>	1989
IEC 155 (mod)	1983	Starters for tubular fluorescent lamps	EN 60155 <sup>2)</sup>	1989
IEC 192	1973	Low-pressure sodium vapour lamps	EN 60192 <sup>3)</sup>	1993
IEC 598-1 (mod)	1992	Luminaires Part 1: General requirements and tests	EN 60598-1 + corr. May	1993 1996
A1 (mod)	1993		A1	1996
IEC 662	1980	High-pressure sodium vapour lamps	EN 60662 <sup>4)</sup>	1993
IEC 921 (mod)	1988	Ballasts for tubular fluorescent lamps Performance requirements	EN 60921	1991
IEC 922	1989	Ballasts for discharge lamps (excluding tubular fluorescent lamps) - General and safety requirements	EN 60922	1991
IEC 923 (mod)	1988	Ballasts for discharge lamps (excluding tubular fluorescent lamps) - Performance requirements	EN 60923 <sup>5)</sup>	1991
IEC 926 (mod)	1990	Starting devices (other than glow starters) General and safety requirements	EN 60926 <sup>6)</sup>	1990

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

2) EN 60155 is superseded by EN 60155:1995, which is based on IEC 155:1993.

3) EN 60192 includes A1:1979 + A2:1988 + A3:1992 to IEC 192.

4) EN 60662 includes A2:1987 + A3:1990 to IEC 662.

5) EN 60923 is superseded by EN 60923:1996, which is based on IEC 923:1995.

6) EN 60926 is superseded by EN 60926:1996, which is based on IEC 926:1995, mod.

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**NORME  
INTERNATIONALE  
INTERNATIONAL  
STANDARD**

**CEI  
IEC  
927**

Deuxième édition  
Second edition  
1996-06

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**Appareils auxiliaires pour lampes –  
Dispositifs d'amorçage (autres que starters  
à lueur)  
Prescriptions de performance**

**Auxiliaries for lamps –  
Starting devices (other than glow starters)  
Performance requirements**

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Commission Electrotechnique Internationale  
International Electrotechnical Commission  
Международная Электротехническая Комиссия

CODE PRIX  
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● Pour prix, voir catalogue en vigueur  
For price, see current catalogue

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**AUXILIARIES FOR LAMPS –  
STARTING DEVICES (OTHER THAN GLOW STARTERS)  
PERFORMANCE 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 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 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, 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 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 patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International standard IEC 927 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 1988, amendment 1 (1990) and amendment 2 (1995). This second edition constitutes a technical revision.

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

FDIS	Report on voting
34C/330/FDIS	34C/377/RVD

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

[SIST EN 60927:2000](https://standards.iteh.ai/catalog/standards/sist/c1f0118b-c78f-432d-9614-3c81909/sist-en-60927-2000)

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

Annex B is for information only.

## AUXILIARIES FOR LAMPS – STARTING DEVICES (OTHER THAN GLOW STARTERS) PERFORMANCE REQUIREMENTS

### Section 1: General requirements

#### 1 Scope

This standard specifies performance requirements for starting devices (starters and ignitors) for tubular fluorescent and other discharge lamps for use on a.c. supplies up to 1000 V at 50 Hz or 60 Hz, which produce starting pulses not greater than 5 kV. It should be read in conjunction with IEC 926.

NOTE – All glow starters for fluorescent and other discharge lamps including thermal relay/cut-outs will be included in IEC 155.

#### 1.1 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 155: 1983, *Starters for tubular fluorescent lamps*

IEC 192: 1973, *Low pressure sodium vapour lamps*

IEC 598-1: 1992, *Luminaires – Part 1: General requirements and tests*  
Amendment 1 (1993)

IEC 662: 1980, *High pressure sodium vapour lamps*

IEC 921: 1988, *Ballast for tubular lamps: Performance requirements*  
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IEC 922: 1989, *Ballasts for discharge lamps (excluding tubular fluorescent lamps): General and safety requirements*

[SIST EN 60927:2000](https://standards.iteh.ai/catalog/standards/sist/c1f0118b-c78f-432d-9614-828091c16027/iec-922-1989)

[https://standards.iteh.ai/catalog/standards/sist/c1f0118b-c78f-432d-9614-](https://standards.iteh.ai/catalog/standards/sist/c1f0118b-c78f-432d-9614-828091c16027/iec-922-1989)

IEC 923: 1988, *Ballasts for discharge lamps (excluding tubular fluorescent lamps): Performance requirements*

IEC 926: 1988, *Starting devices (other than glow starters): General and safety requirements*

## 2 Definitions

The definitions of IEC 926 apply, together with the following:

**2.1 starter with mechanical switching element:** A starter which provides cathode pre-heating current and lamp starting pulse(s) by mechanical means (e.g. thermal or magnetic).

**2.2 starter with electronic switching element:** A starter which provides cathode pre-heating current and lamp starting voltage(s) or pulse(s) by electronic means and contains no moving parts.

**2.3 deactivated lamp:** A lamp in which one or both cathodes are deprived of emitting material but neither of which is broken.

**2.4 non-re-operating level:** A reduced level of voltage and/or current at which a starting device must not re-operate after the completion of the starting cycle, and the lamp is operating normally.

**2.5 maximum abnormal current:** The value of continuous r.m.s. current through the ballast which shall not be exceeded at the end of the starting cycle when the circuit is in an abnormal condition (e.g. deactivated lamp, or lamp that has been removed).

**2.6 starting aid:** A starting aid can be either a conductive strip affixed to the outer surface of a lamp, or a conductive plate which is placed within an appropriate distance from a lamp.

A starting aid can only be effective when it has an adequate potential difference from one end of the lamp.

**2.7 maximum case temperature ( $t_c + X$ ) under abnormal conditions:** maximum allowable case temperature of the ignitor under abnormal conditions with metal halide lamps. The value of ( $t_c + X$ ) is declared by the manufacturer.

## 3 General requirements for tests

3.1 Only requirements for type tests are included.

Unless otherwise specified, the tests shall be made at an ambient temperature between 10 °C and 30 °C.

The tests shall be carried out in the order of the clauses of this standard.

The following numbers of samples shall be submitted:

- six samples of starters as defined in 2.1 and 2.2;
- two samples of ignitors (where appropriate, together with those circuit components which are necessary to carry out the tests).

### 3.2 Supply voltage

The total harmonic content of the supply voltage shall not exceed 3 %, the harmonic content being defined as the root-mean-square (r.m.s.) summation of the individual harmonic components, using the fundamental as 100 %.

Care shall be taken that this applies under all conditions that occur during the measurement.

NOTE – This implies that the source of supply will have sufficient power and that the supply circuit has sufficiently low impedance at supply frequency and impulse frequency compared with the ballast impedance. The correct impedance at impulse frequency can be obtained by connecting a 2  $\mu$ F (approximately) capacitor in parallel with the source.

3.3 All starting devices specified in this standard shall meet the requirements of IEC 926.

#### 4 Marking

The marking requirements of IEC 926 shall apply, together with the following, to be either clearly marked on the starting device or made available in the manufacturer's catalogue, or the like.

- a) The manufacturer shall declare the type of switching element as defined in 2.1 and 2.2.
- b) The manufacturer shall declare the maximum load capacitance for satisfactory operation of the ignitor.
- c) The manufacturer shall declare the allowable maximum case temperature under abnormal conditions ( $t_c + X$ ) of the ignitor.

### Section 2: Performance requirements for starters (other than glow starters) for fluorescent lamps

#### 5 Scope

This section specifies performance requirements for starters other than glow starters, used with tubular fluorescent lamps with pre-heated cathodes, and their associated ballasts. (See IEC 81 and IEC 921, where appropriate.)

#### 6 Starting test

##### 6.1 Starting test quantity

The starting test quantity consists of six new starters which have not been subjected to the tests specified in IEC 926.

##### 6.2 Conditions of acceptance (standards.iteh.ai)

The type is considered as satisfying the requirements of this subclause if all six starters comply with the appropriate tests specified in 6.4 to 6.8. If one failure occurs, a further six starters shall be selected and tested and all these shall comply. If more than one failure occurs the starter is deemed not to satisfy the requirements of this clause.

##### 6.3 Conditions of test

###### 6.3.1 Circuit

The starter is tested in the circuit declared by the manufacturer.

A starting aid complying with the requirements of table 1 shall be used unless otherwise indicated on the starter or in the manufacturer's literature.