



SLOVENSKI STANDARD

SIST EN 55015:1997

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Nadomešča:
SIST EN 55015:1995

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15:1996)

Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment (CISPR 15:1996)

Grenzwerte und Meßverfahren für Funkstörungen von elektrischen Beleuchtungseinrichtungen und ähnlichen Elektrogeräten
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Limites et méthodes de mesure des perturbations radioélectriques produites par les appareils électriques d'éclairage et les appareils analogues
<http://standards.iteh.ai/catalog/standards/sist/116-4dec-86e5-dd528aa62a6b/sist-en-55015-1997>

Ta slovenski standard je istoveten z: EN 55015:1996

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33.100.99 Drugi vidiki v zvezi z EMC Other aspects related to EMC

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EUROPEAN STANDARD
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English version

**Limits and methods of measurement of radio disturbance
characteristics of electrical lighting and similar equipment
(CISPR 15:1996)**

Limites et méthodes de mesure des
perturbations radioélectriques produites
par les appareils électriques d'éclairage
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This European Standard was approved by CENELEC on 1995-11-28. 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 CISPR/F/186/FDIS + CISPR/F/186A/FDIS, future edition 5 of CISPR 15, prepared by CISPR SC F: Interference relating to household appliances, tools, lighting equipment and similar apparatus, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 55015 on 1995-11-28.

This European Standard supersedes EN 55015:1993.

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) 1996-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2000-01-01

For dimmers and similar electronic switches the terminal voltage disturbance limits of EN 55014:1993 apply until 2000-01-01.

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annexes A, B and ZA are normative and annex C is informative.
Annex ZA has been added by CENELEC.

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Endorsement notice

The text of the International Standard CISPR 15:1996 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 50(161)	1990	International Electrotechnical Vocabulary (IEV) Chapter 161: Electromagnetic compatibility	-	-
IEC 50(845)	1987	Chapter 845: Lighting	-	-
IEC 155	1993	Glow-starters for fluorescent lamps	EN 60155	1995
IEC 598 (mod)	series	Luminaires SIST EN 55015:1997 https://standards.iteh.ai/catalog/standards/sist/8c4c8cb0-d116-4dee-86e5-dd528aa62a6b/sist-en-55015-1997	EN 60598	series
CISPR 11 (mod)	1990	Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment	EN 55011	1991
CISPR 16-1	1993	Specification for radio disturbance and immunity measuring apparatus and methods Part 1: Radio disturbance and immunity measuring apparatus	-	-

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COMITÉ INTERNATIONAL SPÉCIAL DES PERTURBATIONS RADIOÉLECTRIQUES
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**Limites et méthodes de mesure
des perturbations radioélectriques
produites par les appareils électriques
d'éclairage et les appareils analogues**

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Limits and methods of measurement
of radio disturbance characteristics of
electrical lighting and similar equipment**

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Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION
INTERNATIONAL SPECIAL COMMITTEE ON RADIO INTERFERENCE

**LIMITS AND METHODS OF MEASUREMENT OF
RADIO DISTURBANCE CHARACTERISTICS OF ELECTRICAL LIGHTING
AND SIMILAR EQUIPMENT**

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.

This standard was prepared by CISPR, subcommittee F: Interference relating to household appliances, tools, lighting equipment and similar apparatus.

This fifth edition replaces the fourth edition published in 1992.

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

DIS	Result of voting
CISPR/F/186/DIS	CISPR/F/195/RVD

The main technical changes are:

- limitation of the scope to electromagnetic disturbances only. A standard for immunity requirements for lighting equipment is prepared by IEC technical committee 34;
- full application of the limits to all kinds of lighting equipment; lamps, luminaires and auxiliaries;
- introduction of operation conditions for lighting equipment;
- change of the method of measurement of insertion loss.

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

Annex C is for information only.

LIMITS AND METHODS OF MEASUREMENT OF RADIO DISTURBANCE CHARACTERISTICS OF ELECTRICAL LIGHTING AND SIMILAR EQUIPMENT

1 Scope

This standard applies to the emission (radiated and conducted) of radiofrequency disturbances from:

- all lighting equipment with a primary function of generating and/or distributing light intended for illumination purposes, and intended either for connection to the low voltage electricity supply or for battery operation;
- the lighting part of multi-function equipment where one of the primary functions of this is illumination;
- independent auxiliaries exclusively for use with lighting equipment;
- UV and IR radiation equipment;
- neon advertising signs;
- street/flood lighting intended for outdoor use;
- transport lighting (installed in buses and trains).

Excluded from the scope of this standard are:

- lighting equipment for aircraft and airports;
- apparatus for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other IEC or CISPR standards.

NOTE - Examples are:

- built-in lighting devices in other equipment, for example scale illumination or neon devices;
- photocopiers;
- slide projectors;
- lighting equipment for road vehicles.

The frequency range covered is 9 kHz to 400 GHz.

Multi-function equipment which is subjected simultaneously to different clauses of this standard and/or other standards shall meet the provisions of each clause/standard with the relevant functions in operation.

The limits in this standard have been determined on a probabilistic basis to keep the suppression of disturbances within economically reasonable limits while still achieving an adequate level of radio protection and electromagnetic compatibility. In exceptional cases additional provisions may be required.

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 to the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 50(161): 1990, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 50(845): 1987, *International Electrotechnical Vocabulary (IEV) – Chapter 845: Lighting*

IEC 155: 1993, *Glow-starters for fluorescent lamps*

IEC 598: *Luminaires*

CISPR 11: 1990, *Limits and methods of measurement of electromagnetic disturbance characteristics of industrial, scientific and medical (ISM) radio-frequency equipment*

CISPR 16-1: 1993, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1: Radio disturbance and immunity measuring apparatus*

3 Definitions

For the purpose of this International Standard, the definitions contained in IEC 50(161) apply.

Continuous disturbance may be either broadband, for instance caused by the switching operations or by unstable gas-discharges in the lamp electrode region, or may be narrowband, for instance caused by electronic control devices operating at dedicated frequencies.

NOTE – Instead of the concept of "broadband" and "narrowband", a distinction is made in this standard between two related kinds of disturbance, defined by the type of the applied detector. For this purpose, limits have been defined with respect to the measurement with the quasi-peak detector and with the average detector. By using this approach also a combination of broadband and narrowband disturbances can be assessed.

4 Limits

4.1 Frequency ranges

In 4.2, 4.3 and 4.4 limits are given as a function of frequency range. No measurements need to be performed at frequencies where no limits are specified.

NOTE – The World Administrative Radiocommunications Conference (WARC) has in 1979 reduced the lower frequency limit in Region I to 148,5 kHz; for applications falling within the scope of this standard, tests at 150 kHz are considered adequate, since 148,5 kHz falls within the receiver bandwidth.

4.2 Insertion loss

The minimum values of the insertion loss for the frequency range 150 kHz to 1 605 kHz are given in table 1.

Table 1 – Minimum values of insertion loss

Frequency range kHz	Minimum values dB
150 to 160	28
160 to 1 400	28 to 20*
1 400 to 1 605	20
* Decreasing linearly with the logarithm of frequency.	

4.3 Disturbance voltages

4.3.1 Mains terminals

The limits of the mains terminal disturbance voltages for the frequency range 9 kHz to 30 MHz are given in table 2a.

Table 2a – Disturbance voltage limits at mains terminals
(standards.iteh.ai)

Frequency range	SIST EN 55015:1997 Limits dB (µV)*	
	Quasi-peak	Average
9 kHz to 50 kHz**	110	—
50 kHz to 150 kHz**	90 to 80***	—
150 kHz to 0,5 MHz	66 to 56***	56 to 46***
0,5 MHz to 5 MHz	56	46
5 MHz to 30 MHz	60	50
<p>* At the transition frequency the lower limit applies.</p> <p>** The limit values in the frequency range 9 kHz to 150 kHz are considered to be "provisional limits" which may be modified after some years of experience.</p> <p>*** The limit decreases linearly with the logarithm of the frequency in the ranges 50 kHz to 150 kHz and 150 kHz to 0,5 MHz.</p> <p>NOTE – In Japan the limits in the frequency range 9 kHz to 150 kHz are not applicable.</p>		

4.3.2 Load and control terminals

The limits of the load and control terminal disturbance voltages for the frequency range 150 kHz to 30 MHz are given in table 2b.

Table 2b – Disturbance voltage limits at load and control terminals

Frequency range MHz	Limits dB (μ V)*	
	Quasi-peak	Average
0,15 to 0,50	80	70
0,50 to 30	74	64

* At the transition frequency the lower limit applies.

4.4 Radiated electromagnetic disturbances

The quasi-peak limits of the magnetic component of the radiated disturbance field strength in the frequency range 9 kHz to 30 MHz measured as a current in 2 m, 3 m or 4 m loop antennas around the lighting equipment, are given in table 3.

The limits for the 2 m loop diameter apply to equipment not exceeding a length of 1,6 m, those for the 3 m loop diameter for equipment having a length in between 1,6 m and 2,6 m and those for the 4 m loop diameter for equipment having a length in between 2,6 m and 3,6 m.

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Table 3 – Radiated electromagnetic disturbance limits

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Frequency range	Limits for loop diameter dB (A)*		
	2 m	3 m	4 m
9 kHz to 70 kHz	88	81	75
70 kHz to 150 kHz	88 to 58**	81 to 51**	75 to 45**
150 kHz to 2,2 MHz	58 to 26**	51 to 22**	45 to 16**
2,2 MHz to 3,0 MHz	58	51	45
3,0 MHz to 30 MHz	22	15 to 16***	9 to 12***

* At the transition frequency, the lower limit applies.
 ** Decreasing linearly with the logarithm of the frequency.
 *** Increasing linearly with the logarithm of the frequency.
 NOTE – In Japan, the limits for frequencies 9 kHz to 150 kHz do not apply.

4.5 Limits at designated frequencies

Certain frequencies are designated by the International Telecommunication Union (ITU) for use as fundamental frequencies for ISM equipment (Resolution No. 63 (1979) of the ITU regulations). These frequencies and related field strength limits are listed in table 4.

Limits of the terminal disturbance voltages within the frequency bands 6,765 to 6,795, 13,553 to 13,567 and 26,957 to 27,283 MHz are under consideration.

NOTE - In individual countries, different or additional frequencies may be designated for use by ISM equipment.

Table 4 - Limits of disturbance field strengths at frequencies designated for use by ISM equipment

Central frequency MHz	Frequency band MHz	Limit of disturbance field strength dB ($\mu\text{V}/\text{m}$) measured at 10 m distance	No. of appropriate footnote to the table of frequency allocation of the ITU radio regulations
6,780	6,765 to 6,795	100 (magnetic component)	524*
13,560	13,553 to 13,567	100 (magnetic component)	534
27,120	26,957 to 27,283	100 (magnetic component)	546
40,680	40,660 to 40,700	100 (electric component)	548
433,922	433,050 to 434,790	100 (electric component)	661*, 662 (region 1 only)
915	902 to 928	100 (electric component)	707 (region 2 only)
2 450	2 400 to 2 500	100 (electric component)	752
5 800	5 725 to 5 875	100 (electric component)	806
24 125	24 000 to 24 250	100 (electric component)	881
61 250	61 000 to 61 500	100 (electric component)	911*
122 500	122 000 to 123 000	100 (electric component)	916*
245 000	244 000 to 246 000	100 (electric component)	922*

* Use of these frequency bands shall be subjected to special authorization by administrations concerned in agreement with other administrations whose radio communication services might be affected.

5 Application of the limits

5.1 General

Application of the limits for the various kinds of lighting equipment as mentioned in the scope of this standard are given in 5.3 to 5.9.

No emission requirements apply to lamps other than self-ballasted lamps nor to auxiliaries incorporated in luminaires, in self-ballasted lamps or in semi-luminaires. (See, however, note 2 of 5.4.1 in this respect.)

The disturbance caused by manual or automatic operation of a switch (external or included in equipment) to connect or disconnect the mains shall be disregarded. This includes manual on/off switches or, for example, switches activated by sensors or ripple control receivers. However, switches which will be repeatedly operated (e.g. such as those of advertising signs) are not included in this exception.