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CISPR 15

Edition 8.0 2013-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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

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

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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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CISPR/F/Publication CISPR 15 (2013), eighth edition/I-SH 01

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

INTERPRETATION SHEET 1

This interpretation sheet has been prepared by subcommittee CISPR F: Interference relating to household appliances, tools, lighting equipment and similar apparatus, of IEC technical committee CISPR: International special committee on radio interference.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
CISPR/F/583/ISH	CISPR/F/591/RVD

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

CISPR 15 interpretation sheet on the assessment of retrofit Extra Low Voltage LED lamps

Introduction

During the CISPR meeting in Seoul 2011 the IARU reported that a number of LED lighting products are causing interference with amateur radio reception. See item 15 of the minutes CISPR/1218/RM.

In addition to this verbal report, the IARU submitted in January 2012 a detailed written report which was circulated as CISPR/F/565/INF. Major sources of interference are some types of Extra Low Voltage (e.g. 12 V) LED lamps for which the current CISPR 15 requirements are not clear. Additional clarification of the standard was requested urgently.

In response the CISPR F management committee issued document CISPR/F/568/INF setting out an action plan to resolve the issue at short notice.

Part of the solution is this Interpretation Sheet which details the assessment of retrofit ELV LED lamps.

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Question: **How are the requirements of CISPR 15 applied to retrofit Extra Low Voltage (ELV) LED lamps?**

Interpretation: **When assessing retrofit ELV LED lamps against the requirements of CISPR 15 the following procedure shall be applied.**

ELV LED lamps without active switching electronic components are considered to fulfil the requirements of CISPR 15 without test.

All other types of retrofit ELV LED lamps shall be tested in conjunction with a wire wound 50 or 60 Hz ring-core transformer. The use of such a transformer is considered to be the worst-case condition and shall be used unless it is clearly stated in the manufacturer's instructions that the lamp is unsuitable for use with such a transformer. In this case measurements shall be performed in combination with a typical compliant electronic transformer for halogen lamps.

The combination of transformer and ELV LED lamp shall comply with the mains disturbance voltage limits of Table 2a and the radiated disturbance limits of Tables 3a and 3b.

During the disturbance voltage measurement, the ELV LED lamp is mounted in a conical metal housing as described in Figure 7. The ELV LED lamp is then connected to the transformer by a flexible 3-core cable consisting of two ELV supply conductors and the earth connection to the conical housing. The length of this cable shall be as short as possible. The metal conical housing shall be positioned with its cable entrance close to the transformer.

The combination of transformer and conical metal housing shall be tested as a luminaire in accordance with the requirements of 8.2.

When performing the radiated disturbance measurements in accordance with Clause 9, the conical metal housing shall not be used.

References are to CISPR 15:2013.

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CISPR/F/Publication CISPR 15 (2013), eighth edition/I-SH 02

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

INTERPRETATION SHEET 2

This interpretation sheet has been prepared by subcommittee CISPR F: Interference relating to household appliances, tools, lighting equipment and similar apparatus, of IEC technical committee CISPR: International special committee on radio interference.

The text of this interpretation sheet is based on the following documents:

ISH	Report on voting
CISPR/F/584/ISH	CISPR/F/592/RVD

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

CISPR 15 interpretation sheet on: Test conditions for wall dimmers

Introduction

More and more incandescent lamps are replaced by energy saving lamps (fluorescent and LED). Some types are dimmable by phase control of the supply voltage. New wall dimmers are developed to improve the dim performance when the dimmer is loaded with energy saving lamps. CISPR 15 is not clear on how to test these types of wall dimmers.

This interpretation sheet has been prepared by the Joint 17B-23B-34A-77A IEC Forum on the dimming of electronic self-ballasted lamps and was finalized during the CISPR/F/WG2 meeting in Bangkok.

Question: How to test a wall dimmer which is suitable for energy saving lamps?

Relevant text CISPR 15:

Clause 8 of CISPR 15 specifies the 'Method of measurement of disturbance voltages'.

8.3.1 '**Directly operating devices'** specifies the test arrangement of independent directly operating light regulating devices such as wall dimmers.

The second paragraph reads:

'Unless otherwise specified by the manufacturer, the regulating device shall be measured with the maximum allowed load consisting of incandescent lamps as specified by the manufacturer.'

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Answer:

1) Independent directly operating light regulating devices (e.g. wall dimmers) which are suitable for incandescent lamps and other types of lighting equipment (e.g. self-ballasted lamps) shall be tested with incandescent lamps.
2) Independent directly operating light regulating devices which are only suitable for lighting equipment other than incandescent lamps shall be tested with the appropriate lighting equipment as provided by the manufacturer.

The above will be included in the full revision of CISPR 15, following the 8th edition.

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CONTENTS

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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International Standard CISPR 15 has been prepared by subcommittee CIS/F: Interference relating to household appliances tools, lighting equipment and similar apparatus, of IEC technical committee CISPR: International special committee on radio interference.

This eighth edition cancels and replaces the seventh edition published in 2005, its Amendment 1 (2006) and Amendment 2 (2008). It is a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- inclusion of LED light sources and luminaires, clarification of test supply voltage and frequency, and improvements to clause 5 relating to the application of limits to the various types of lighting equipment covered under the scope of CISPR 15;
- notes relating to Japan in Tables 2a and 3a have been removed;
- introduction of requirements for flashing type emergency lighting luminaires utilizing xenon lamps;
- introduction of requirements for neon and other advertising signs;

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- clarification of the requirement for radiated disturbances between 30 MHz and 300 MHz in case the operating frequency of the light source is below 100 Hz.

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

FDIS	Report on voting
CIS/F/598/FDIS	CIS/F/602/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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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 operating in the ISM frequency bands (as defined in Resolution 63 (1979) of the ITU Radio Regulation);
– lighting equipment for aircraft and airports;
– apparatus for which the electromagnetic compatibility requirements in the radio-frequency range are explicitly formulated in other 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.

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2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050-161, *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 60155, *Glow-starters for fluorescent lamps*

IEC 61000-4-6:2008, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*
Amendment 1:2010

CISPR 16-1-1:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*
Amendment 1:2010

CISPR 16-1-2:2003, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary equipment – Conducted disturbances*
Amendment 1:2004
Amendment 2:2006

CISPR 16-1-4:2010, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-4: Radio disturbance and immunity measuring apparatus – Antennas and test sites for radiated disturbance measurements*
Amendment 1:2012

CISPR 16-4-2:2011, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4-2: Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements*

CISPR 32:2012, *Electromagnetic compatibility of multimedia equipment – Emission requirements*

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CISPR/F/Publication CISPR 15 (2013), huitième édition/I-SH 01

LIMITES ET MÉTHODES DE MESURE DES PERTURBATIONS RADIOÉLECTRIQUES PRODUITES PAR LES APPAREILS ÉLECTRIQUES D'ÉCLAIRAGE ET LES APPAREILS ANALOGUES

FEUILLE D'INTERPRÉTATION 1

La présente feuille d'interprétation a été établie par le sous-comité CISPR F: Perturbations relatives aux appareils domestiques, aux outils, aux appareils d'éclairage et aux appareils analogues, du comité d'études CISPR de la CEI: Comité international spécial des perturbations radioélectriques.

Le texte de cette feuille d'interprétation est issue des documents suivants:

ISH	Rapport de vote
CISPR/F/583/FDIS	CISPR/F/591/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette feuille d'interprétation.

CISPR 15 feuille d'interprétation sur l'évaluation des lampes LED *retrofit* (ou améliorées) à très basse tension

Introduction

Au cours de la réunion CISPR de Séoul en 2011, l'Union internationale des radioamateurs (IARU) a signalé qu'un certain nombre de produits d'éclairage LED provoquaient des perturbations pour la réception radioamateur. Se reporter au point 15 du procès-verbal CISPR/1218/RM.

Outre ce rapport verbal, l'IARU a soumis en janvier 2012 un rapport écrit détaillé diffusé sous la désignation CISPR/F/565/INF. Des sources majeures de perturbations proviennent de certains types de lampes LED à Très Basse Tension (comme par ex.12 V) pour lesquelles les exigences de la CISPR 15 actuelle ne sont pas claires. Il a été demandé en urgence un éclaircissement supplémentaire de la norme.

En réponse, le comité de gestion CISPR F a publié le document CISPR/F/568/INF établissant un plan d'action pour résoudre cette question à court terme.

Une partie de la solution figure dans la Feuille d'Interprétation précisant l'évaluation des lampes LED TBT de remplacement (installées à la place de lampes conventionnelles).

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Question: **Quelles sont les exigences de la CISPR 15 appliquées aux lampes LED de remplacement à très basse tension (TBT)?**

Interprétation: **Lors de l'évaluation des lampes LED de remplacement TBT selon les exigences de la CISPR 15 la procédure suivante doit être appliquée.**

Les lampes TBT LED dénuées de composants électroniques de commutation actifs sont considérées comme remplissant les exigences de la CISPR 15 sans essai.

Tous les autres types de lampes TBT LED de remplacement doivent être soumis à essai conjointement à un transformateur toroïdal 50 ou 60 Hz bobiné. L'utilisation d'un tel transformateur est considérée comme étant la condition la plus défavorable et il doit être utilisé à moins qu'il ne soit clairement indiqué dans les instructions du fabricant que la lampe ne convient pas pour l'utilisation avec un tel transformateur. Dans ce cas les mesures doivent être réalisées en association avec un transformateur électronique conforme typique pour les lampes halogène.

La combinaison du transformateur et de la lampe LED TBT doit être conforme aux limites de la tension perturbatrice d'alimentation figurant au Tableau 2a et aux limites des perturbations rayonnées des Tableaux 3a et 3b.

Au cours de la mesure de la tension perturbatrice, la lampe LED TBT est montée dans un boîtier métallique conique décrit à la Figure 7. La lampe LED TBT est ensuite raccordée au transformateur par un câble souple à trois conducteurs constitué de deux conducteurs d'alimentation TBT et de la connexion de terre au boîtier conique. La longueur de ce câble doit être aussi courte que possible. Le boîtier conique en métal doit être mis en position de sorte que son entrée de câble soit à proximité du transformateur.

La combinaison du transformateur et du boîtier conique en métal doit être soumise à essai comme un luminaire conformément aux exigences du 8.2.

En réalisant les mesures des perturbations rayonnées selon l'Article 9, le boîtier conique en métal en doit pas être utilisé.

Les références figurent par rapport à la CISPR 15:2013.

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LIMITES ET MÉTHODES DE MESURE DES PERTURBATIONS RADIOÉLECTRIQUES PRODUITES PAR LES APPAREILS ÉLECTRIQUES D'ÉCLAIRAGE ET LES APPAREILS ANALOGUES

FEUILLE D'INTERPRÉTATION 2

La présente feuille d'interprétation a été établie par le sous-comité CISPR F: Perturbations relatives aux appareils domestiques, aux outils, aux appareils d'éclairage et aux appareils analogues, du comité d'études CISPR de la CEI: Comité international spécial des perturbations radioélectriques.

Le texte de cette feuille d'interprétation est issue des documents suivants:

ISH	Rapport de vote
CISPR/F/584/FDIS	CISPR/F/592/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à l'approbation de cette feuille d'interprétation.

_____

CISPR 15 feuille d'interprétation sur: Conditions d'essais pour les variateurs muraux

Introduction

De plus en plus de lampes à incandescence sont remplacées par des lampes à basse consommation d'énergie (fluorescentes et LED). Certains types permettent la gradation de lumière au moyen de la commande de phase de la tension d'alimentation. De nouveaux variateurs muraux sont mis au point, en vue d'améliorer la performance de la gradation de l'intensité lumineuse lorsque le variateur est chargé en lampes à basse consommation d'énergie. La CISPR 15 n'apporte pas d'éclaircissements quant à la façon de soumettre à essai ces types de variateurs muraux.

Cette feuille d'interprétation a été établie par le Forum CEI commun 17B-23B-34A-77A (*Joint 17B-23B-34A-77A IEC Forum*) sur le thème de la gradation des lampes électroniques à ballast intégré et il a été finalisé au cours de la réunion du CISPR/F/GT2 à Bangkok.

Question: Comment procéder aux essais d'un variateur mural qui convient aux lampes à basse consommation d'énergie?

Texte pertinent de la CISPR 15:

L'Article 8 de la CISPR 15 spécifie la 'Méthode de mesure des tensions perturbatrices'.

Le 8.3.1 '**Dispositifs à action directe'** spécifie le montage d'essai des dispositifs de régulation de lumière indépendants à action directe, tels que les variateurs muraux.

Le deuxième alinéa indique:

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‘Sauf spécification contraire du fabricant, on doit mesurer le dispositif de régulation avec la charge maximale autorisée par le fabricant, cette charge étant constituée de lampes à incandescence.’

Réponse:

1) Les dispositifs de régulation de lumière indépendants à action directe (comme les variateurs muraux) qui conviennent pour les lampes à incandescence et autres types d'appareils d'éclairage (comme les lampes à ballast intégré) doivent être soumis à essai avec des lampes à incandescence.
2) Les dispositifs de régulation de lumière indépendants à action directe qui conviennent uniquement pour les appareils d'éclairage autres que les lampes à incandescence doivent être soumis à essai avec l'appareil d'éclairage approprié tel que fourni par le fabricant.

Le texte qui précède sera inclus dans la révision de la CISPR 15, à la suite de la 8ème édition.

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