IEC 61347-2-13

Edition 2.0 2014-09

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Lamp controlgear –
Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

Appareillage de lampes –
Partie 2-13: Exigences particulières pour les appareillages électroniques alimentés en courant continu ou alternatif pour les modules de LED

IEC 61347-2-13:2014-09(en-fr)

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 8
4 General requirements 9
5 General notes on tests 10
6 Classification 10
7 Marking 10
7.1 Mandatory marking 10
7.2 Information to be provided if applicable 10
8 Protection against accidental contact with live parts 10
9 Terminals 10
10 Provisions for protective earthing 11
11 Moisture resistance and insulation 11
12 Electric strength 11
13 Thermal endurance test for windings of ballasts 11
14 Fault conditions 11
15 Transformer heating 11
15.1 General 11
15.2 Normal operation 11
15.3 Abnormal operation 11
16 Construction 12
17 Creepage distances and clearances 12
18 Screws, current-carrying parts and connections 12
19 Resistance to heat, fire and tracking 12
20 Resistance to corrosion 12
Annex A (normative) Test to establish whether a conductive part is a live part which may cause an electric shock 13
Annex B (normative) Particular requirements for thermally protected lamp controlgear 14
Annex C (normative) Particular requirements for electronic lamp controlgear with means of protection against overheating 15
Annex D (normative) Requirements for carrying out the heating tests of thermally protected lamp controlgear 16
Annex E (normative) Use of constant *S* other than 4 500 in t_W tests 17
Annex F (normative) Draught-proof enclosure 18
Annex G (normative) Explanation of the derivation of the values of pulse voltages 19
Annex H (normative) Tests 20
Annex I (normative) Particular additional requirements for SELV d.c. or a.c. supplied electronic controlgear for LED modules 21
Annex J (normative) Particular additional safety requirements for a.c., a.c./d.c. or d.c. supplied electronic controlgear for emergency lighting 22
J.1 General 22

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J.2 Marking 22
J.2.1 Mandatory markings 22
J.2.2 Information to be provided if applicable 22
J.3 General notes on tests 22
J.4 Starting conditions 23
J.5 Operating condition 23
J.6 Emergency supply current 23
J.7 EMC immunity 23
J.8 Pulse voltage from central battery systems 23
J.9 Tests for abnormal conditions 24
J.10 Temperature cycling test and endurance test 24
J.11 Functional safety (EOF_X) 24
Bibliography 25

Table J.1 – Pulse voltages 23

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Document Sharing Hub

Full document details: IEC 61347-2-13 2014

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LAMP CONTROLGEAR –

Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

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International Standard IEC 61347-2-13 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 2006. This edition constitutes a technical revision.

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

a) Replacement of the SELV-equivalent requirements by SELV requirements and reference to the SELV requirements of Annex L in IEC 61347-1:2007/AMD2:2012.

b) Reference to IEC 61347-1 for the protection against accidental contact with live parts, moisture resistance and insulation and electric strength.

c) New Annex J for emergency lighting requirements.

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

FDIS	Report on voting
34C/1092/FDIS	34C/1106/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 standard shall be used in conjunction with IEC 61347-1.Where the requirements of any of the clauses of IEC 61347-1 are referred to in this standard by the phrase "The requirements of Clause n of IEC 61347-1:2007/AMD1:2010/AMD2:2012, apply", this phrase is interpreted as meaning that all requirements of the clause in question of Part 1 apply, except any which are clearly inapplicable to the specific type of lamp controlgear covered by this particular part of IEC 61347-2.

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

In this standard, the following print types are used:

– requirements: in roman type,
– *test specifications: in italic type,*
– notes: in small roman type.

A list of all parts in the IEC 61347, published under the general title *Lamp controlgear* can be found on the IEC website.

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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INTRODUCTION

This second edition of IEC 61347-2-13 is published in conjunction with IEC 61347-1. The formatting into separately published parts provides for ease of future amendments and revisions. Additional requirements will be added as and when a need for them is recognized.

This standard and the parts which make up IEC 61347-2, in referring to any of the clauses of IEC 61347-1 specify the extent to which such a clause is applicable and the order in which the tests are to be performed; they also include additional requirements as necessary. All parts which make up IEC 61347-2 are self-contained and therefore do not include references to each other.

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LAMP CONTROLGEAR –

Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules

1 Scope

This part of IEC 61347 specifies particular safety requirements for electronic controlgear for use on d.c. or a.c. supplies up to 1 000 V (a.c. at 50 Hz or 60 Hz) and at an output frequency which can deviate from the supply frequency, associated with LED modules.

Controlgear for LED modules specified in this standard are designed to provide constant voltage or current at SELV or higher voltages. Deviations from the pure voltage and current types do not exclude the gear from this standard.

The annexes of IEC 61347-1 which are applicable according to this Part 2-13 and using the word “lamp” are understood to also comprise LED modules.

Particular requirements for SELV controlgear are given in Annex I.

Performance requirements are covered by IEC 62384.

Plug-in controlgear, being part of the luminaire, are covered as for built-in controlgear by the additional requirements of the luminaire standard.

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 61347-1:2007, *Lamp controlgear – Part 1: General and safety* requirements
Amendment 1:2010
Amendment 2:2012

IEC 61347-2-7:2011, *Lamp controlgear – Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)*

IEC 61547, *Equipment for general lighting purposes – EMC immunity requirements*

IEC 61558 (all parts), *Safety of power transformers, power supplies, reactors and similar products*

IEC 61558-2-6:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers*

IEC 61558-2-16:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V – Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units*

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IEC 62384:2006, *DC or AC supplied electronic controlgear for LED modules – Performance requirements*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in IEC 61347-1, as well as the following apply.

3.1
electronic controlgear for LED modules
unit inserted between the supply and one or more LED modules which serves to supply the LED module(s) with its (their) rated voltage or rated current

Note 1 to entry: The unit may consist of one or more separate components and may include means for dimming, correcting the power factor and suppressing radio interference, and futher control functions.

Note 2 to entry: The controlgear consists of a power supply and a control unit.

Note 3 to entry: The controlgear may be partly or totally integrated in the LED module.

3.2
d.c. or a.c. supplied controlgear
controlgear that includes stabilising elements for operating one or more LED module(s)

3.3
SELV controlgear
controlgear providing an SELV output isolated from the supply mains by means such as a safety isolating transformer, as specified in IEC 61558-2-6 and IEC 61558-2-16

3.4
associated controlgear
controlgear designed to supply specific appliance(s) or equipment, incorporated or not incorporated

EXAMPLE: An electronic controlgear within an emergency unit where it is assigned in a one-to-one relation to a battery driven ballast.

3.5
plug-in controlgear
controlgear incorporated in an enclosure provided with an integral plug as the means of connection of the electrical supply

3.6
rated output voltage for constant voltage controlgear
output voltage, at rated supply voltage, rated frequency and at rated output power, assigned to the controlgear

3.7
rated output current for constant current controlgear
output current, at rated supply voltage, rated frequency and at rated output power, assigned to the controlgear

3.8
light emitting diode
LED
solid state device embodying a p-n junction, emitting optical radiation when excited by an electric current

Note 1 to entry: This definition is independent from the existence of enclosure(s) and of terminals.

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[SOURCE: IEC 60050-845:1987, 845.04.40]

3.9
LED module
light source having no cap, incorporating one or more LED package(s) on a printed circuit board, and possibly including one or more of the following:
electrical, optical, mechanical, and thermal components, interfaces and controlgear

Note 1 to entry: A LED module may be integrated (LEDi module, Type 1) or semi-integrated (LEDsi module, Type 2) or nonintegrated (LEDni module, Type 3).

Note 2 to entry: The LED module is usually designed to be part of a LED lamp or LED luminaire.

3.10
maximum output voltage
maximum voltage which can occur between the output terminals for constant current controlgear in any load condition

3.11
emergency lighting
lighting provided for use when the supply to the normal lighting fails; it includes escape lighting and standby lighting

3.12
rated emergency supply voltage or voltage range
rated voltage or voltage range claimed by the manufacturer where the controlgear will operate according specification

3.13
emergency output factor
EOF_x
ratio of the electrical output parameter when the control gear under test is operated in emergency mode to the output electrical parameter when the control gear is operated with the normal lighting conditions

Note 1 to entry: The electrical output parameter can be current (EOF_I), voltage (EOF_V) or power (EOF_W) at the output(s) of the control gear (depending on the module it could be constant current, constant voltage or constant power).

Note 2 to entry: The emergency output factor is the minimum of the values measured at the appropriate time after failure of the normal supply and continuously.

3.14
emergency supply current
rated supply current of the control gear operating in the emergency mode

4 General requirements

The requirements of Clause 4 of IEC 61347-1:2007/AMD2:2012 apply, together with the following additional requirements.

– Controlgear providing SELV shall comply with the requirements of Annex I. This includes insulation resistance, electric strength, creepage distances and clearance between primary and secondary circuits.
– If a separating, isolating or autotransformer is used, it shall comply with the relevant parts of IEC 61558. If, however, insulated winding wires are used for controlgear with an input voltage of up to 300 V, the dielectric strength test voltage is limited to 3 kV for raw material.

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5 General notes on tests

The requirements of Clause 5 of IEC 61347-1:2007/AMD2:2012 apply, with the following additional requirement.

The following number of specimens shall be submitted for testing:

– one unit for the tests of Clauses 6 to 12 and 15 to 20;
– one unit for the tests of Clause 14 (additional units or components, where necessary, may be required in consultation with the manufacturer).

6 Classification

Controlgear are classified according to the method of installation given in Clause 6 of IEC 61347-1:2007 and according to protection against electric shock as:

– auto-wound controlgear;
– separating controlgear;
– isolating controlgear;
– SELV controlgear.

7 Marking

7.1 Mandatory marking

Controlgear, other than integral controlgear, shall be clearly and durably marked, in accordance with the requirements of 7.2 of IEC 61347-1:2007, with the following mandatory markings:

– items a), b), c), d), e), f), k), l), m), t) and u) of 7.1 of IEC 61347-1:2007/AMD2:2012 together with:
– for constant voltage types: P_{rated} rated output power and U_{rated} rated output voltage;
– for constant current types: P_{rated} rated output power and I_{rated} rated output current;
– if applicable: an indication that the controlgear is suitable for operation with LED modules only.

7.2 Information to be provided if applicable

In addition to the above mandatory markings, the following information, if applicable, shall be given either on the controlgear, or be made available in the manufacturer's catalogue or similar:

– items h), i), j) and s) of 7.1 of IEC 61347-1:2007/AMD2:2012together with
– a mention of whether the controlgear has mains-connected windings of transformer.

Windings do not apply to ferrite inductors and ferrite line filters.

8 Protection against accidental contact with live parts

The requirements of Clause 10 of IEC 61347-1:2007/AMD2:2012 apply.

9 Terminals

The requirements of Clause 8 of IEC 61347-1:2007 apply.

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10 Provisions for protective earthing

The requirements of Clause 9 of IEC 61347-1:2007/AMD2:2012 apply.

11 Moisture resistance and insulation

The requirements of Clause 11 of IEC 61347-1:2007/AMD1:2010/AMD2:2012 apply.

12 Electric strength

The requirements of Clause 12 of IEC 61347-1:2007/AMD2:2012 apply.

13 Thermal endurance test for windings of ballasts

The requirements of Clause 13 of IEC 61347-1:2007/AMD2:2012 are not applicable.

14 Fault conditions

The requirements of Clause 14 of IEC 61347-1:2007/AMD1:2010/AMD2:2012 apply, together with the following additional requirements.

In the case of controlgear provided with the marking , the requirements specified in Annex C shall be fulfilled.

15 Transformer heating

15.1 General

If a controlgear contains an SELV, isolating and separating transformer, the controlgear shall be tested according to Clauses L.6 and L.7 of IEC 61347-1:2007/AMD2:2012, where the requirements for controlgear providing SELV are valid also for separating and isolating controlgear.

For SELV controlgear, the output voltage shall not exceed the limits given in 10.4 of IEC 61347-1:2007/AMD2:2012, during the tests of 15.1 and 15.2 of this standard.

15.2 Normal operation

The requirements of Clause L.6 of IEC 61347-1:2007/AMD2:2012 apply, together with the following additional requirement.

For built-in and integral controlgear, tests shall be made under conditions such that the convertor is brought to t_c, as reached under normal operation at rated supply voltage.

15.3 Abnormal operation

The requirements of Clause L.7 of IEC 61347-1:2007/AMD2:2012 apply.

In addition, the following test at any voltage between 90 % and 110 % of the rated supply voltage shall be performed if relevant, with the controlgear operating according to the manufacturer's instructions (including heatsinks, if specified) for 1 h.

Connect double the LED modules or equivalent load for which the controlgear is designed.

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– in parallel to the output terminals, for constant voltage output types;
– in series to the output terminals, for the constant current output types.

During and at the end of the tests specified above, the controlgear shall show no defect impairing safety, nor shall any smoke or flammable gases be produced.

16 Construction

The requirements of Clause 15 of IEC 61347-1:2007/AMD2:2012 apply.

17 Creepage distances and clearances

Unless otherwise specified in Clause 14 of this standard, the requirements of Clause 16 of IEC 61347-1:2007 apply.

18 Screws, current-carrying parts and connections

The requirements of Clause 17 of IEC 61347-1:2007 apply.

19 Resistance to heat, fire and tracking

The requirements of Clause 18 of IEC 61347-1:2007 apply.

20 Resistance to corrosion

The requirements of Clause 19 of IEC 61347-1:2007 apply.

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Annex A
(normative)

Test to establish whether a conductive part is a live part which may cause an electric shock

The requirements of Annex A of IEC 61347-1:2007/AMD2:2012 apply.

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Annex B
(normative)

Particular requirements for thermally protected lamp controlgear

The requirements of Annex B of IEC 61347-1:2007/AMD1:2010/AMD2:2012 are not applicable.

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Annex C
(normative)

Particular requirements for electronic lamp controlgear with means of protection against overheating

The requirements of Annex C of IEC 61347-1:2007 apply.

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