

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Lamp control gear –  
Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control  
gear for fluorescent lamps**

**Appareillages de lampes –  
Partie 2-3: Exigences particulières pour les appareillages électroniques  
alimentés en courant alternatif et/ou en courant continu pour lampes  
fluorescentes**



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2016 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

IEC Central Office  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

### About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies

### About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [csc@iec.ch](mailto:csc@iec.ch).

### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

#### IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

#### Electropedia - [www.electropedia.org](http://www.electropedia.org)

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**Lamp control gear –  
Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control  
gear for fluorescent lamps**

**Appareillages de lampes –  
Partie 2-3: Exigences particulières pour les appareillages électroniques  
alimentés en courant alternatif et/ou en courant continu pour lampes  
fluorescentes**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 29.140.99

ISBN 978-2-8322-3539-3

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

Withdrawn

iTech Standards  
(<https://standards.itech.ai>)  
Document Preview

[IEC 61347-2-3:2011](#)

<https://standards.itech.ai/standards/iec/2d8f66e2-4e66-47ff-b7ee-1996b1ecc65e/iec-61347-2-3-2011>

## REDLINE VERSION

## VERSION REDLINE



**Lamp control gear –  
Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control  
gear for fluorescent lamps**

**Appareillages de lampes –  
Partie 2-3: Exigences particulières pour les appareillages électroniques  
alimentés en courant alternatif et/ou en courant continu pour lampes  
fluorescentes**

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope .....	7
2 Normative references .....	7
3 Terms and definitions .....	7
4 General requirements .....	8
5 General notes on tests.....	8
6 Classification.....	9
7 Marking .....	9
8 Protection against accidental contact with live parts .....	9
9 Terminals .....	9
10 Provisions for earthing.....	10
11 Moisture resistance and insulation .....	10
12 Electric strength .....	10
13 Thermal endurance test for windings.....	10
14 Fault conditions .....	10
15 Protection of associated components.....	10
16 Abnormal conditions .....	12
17 Behaviour of the control gear at end of lamp life.....	13
18 Construction.....	19
19 Creepage distances and clearances.....	19
20 Screws, current-carrying parts and connections.....	19
21 Resistance to heat, fire and tracking .....	19
22 Resistance to corrosion .....	19
Annex A (normative) Test to establish whether a conductive part is a live part which may cause an electric shock .....	24
Annex B (normative) Particular requirements for thermally protected lamp control gear .....	25
Annex C (normative) Particular requirements for electronic lamp control gear with means of protection against overheating .....	26
Annex D (normative) Requirements for carrying out the heating tests of thermally protected lamp control gear.....	27
Annex E (normative) Use of constant S other than 4 500 in $t_w$ tests .....	28
Annex F (normative) Draught-proof enclosure.....	29
Annex G (normative) Explanation of the derivation of the values of pulse voltages .....	30
Annex H (normative) Tests.....	31
Annex I (normative) Measurement of high-frequency leakage current.....	32
Annex J (normative) Particular additional safety requirements for a.c., a.c./d.c. or d.c. supplied electronic control gear for emergency lighting .....	37
Annex K (informative) Components used in the asymmetric pulse test circuit (see Figure 1) .....	41
Annex L (normative) Information for control gear design (from Annex E of IEC 61195) .....	42
Bibliography .....	43

Figure 1 – Asymmetric pulse test circuit .....	14
Figure 2 – Asymmetric power detection circuit.....	16
Figure 3 – Open filament test circuits .....	18
Figure 4 – Circuit for testing rectifying effect.....	20
Figure 5 – Nomographs for the capacitive leakage current limits of HF-operated fluorescent lamps .....	23
Figure I.1 – Leakage current test arrangement for various fluorescent lamps.....	36
Table 1 – Relation between r.m.s. working voltage and maximum peak voltage .....	11
Table J.1 – Pulse voltages .....	40
Table K.1 – Material specification.....	41
Table K.2 – Transformer specification .....	41

Withholding

iTech Standards  
(<https://standards.iteh.ai>)  
Document Preview

IEC 61347-2-3:2011  
<https://standards.iteh.ai/catalog/standards/sic/2d81e6e2-4e66-47ff-b7ee-1996b1ecc65e/iec-61347-2-3-2011>

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### LAMP CONTROL GEAR –

#### Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. 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 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 IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

**This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.**

**IEC 61347-2-3 edition 2.1 contains the second edition (2011-05) [documents 34C/955/FDIS and 34C/968/RVD], its corrigendum 1 (2011-09) and its amendment 1 (2016-07) [documents 34C/1206/FDIS and 34C/1241/RVD].**

**In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.**



International Standard IEC 61347-2-3 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This standard shall be used in conjunction with IEC 61347-1 (2007) and its Amendment 1 (2010).

This second edition constitutes a technical revision.

The significant revisions with respect to the first edition are:

- rectifying test conditions when dimming;
- construction requirements;
- measurement circuits and limits for HF leakage currents;
- modification of the structure to become a standard exclusively for a.c. and d.c. central supplied electronic control gear for general lighting and Annex J cover centrally-supplied emergency control gear.

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

This part 2 supplements or modifies the corresponding clauses in IEC 61347-1 so as to convert that publication into the IEC standard: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps.

NOTE In this standard, the following print types are used:

- Requirements proper: in roman type.
- *Test specifications: in italic type.*
- Explanatory matter: in smaller roman type.

A list of all parts of the IEC 61347 series, published under the general title: *Lamp control gear*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendment 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.

**IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.**

## INTRODUCTION

This second edition of IEC 61347-2-3, published in conjunction with IEC 61347-1, represents an review of the first edition of IEC 61347-2-3. 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 intended to be self-contained and, therefore, do not include references to each other. However, for the case of emergency lighting lamp control gear, some cross-referencing has been necessary.

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 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 control gear covered by this particular part of IEC 61347-2.

iTech Standards  
(<https://standards.iteh.ai>)  
Document Preview

<https://standards.iteh.ai>  
<https://standards.iteh.ai/standards/item/2d81e6e2-4e66-47ff-b7ec-1996b1ecc65e/iec-61347-2-3-2011>

<https://standards.iteh.ai/standards/item/2d81e6e2-4e66-47ff-b7ec-1996b1ecc65e/iec-61347-2-3-2011>

## LAMP CONTROL GEAR –

### Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps

#### 1 Scope

This part of IEC 61347 specifies particular safety requirements for electronic control gear for use on a.c. supplies at 50 Hz or 60 Hz up to 1 000 V and/or d.c. supplies up to 1 000 V ~~at 50 Hz or 60 Hz~~ with lamp operating frequencies deviating from the supply frequency, associated with fluorescent lamps as specified in IEC 60081 and IEC 60901, and other fluorescent lamps for high-frequency operation.

Performance requirements are the subject of IEC 60929.

Particular requirements for electronic control gear with means protection against overheating are given in Annex C.

For emergency lighting operation, particular requirements for control gear operated from a central supply are given in Annex J. Performance requirements appropriate to the safe operation of emergency lighting are also contained in Annex J.

Requirements for emergency lighting control gear operating from non-centralised power supplies are given in IEC 61347-2-7.

NOTE Performance requirements detailed by Annex J are those considered to be safety-related with respect to reliable emergency operation.

#### 2 Normative references

For the purposes of this document, the normative references given in Clause 2 of IEC 61347-1 which are mentioned in this standard apply, together with the following normative references.

IEC 60929: 2011, *AC and/or DC-supplied electronic control gear for tubular fluorescent lamps – Performance requirements*

IEC 61347-1:2007, *Lamp control gear – Part 1: General and safety requirements* Amendment 1(2010)

IEC 61347-2-7, \_\_\_ *Lamp control gear – Part 2-7: Particular requirements for battery supplied electronic control gear for emergency lighting (self-contained)*<sup>1</sup>

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

#### 3 Terms and definitions

For the purposes of this document, the terms and definitions of Clause 3 of IEC 61347-1 apply, together with the following.

<sup>1</sup> To be published

### 3.1

#### **a.c. supplied electronic control gear**

mains-supplied a.c. to a.c. inverter including stabilizing elements for starting and operating one or more fluorescent lamps, generally at high frequency

### 3.2

#### **maximum value of lamp power (of a controllable control gear)**

lamp power (light output) which complies with 8.1 of IEC 60929, unless otherwise declared by the manufacturer or responsible vendor

### 3.3

#### **maximum allowed peak voltage**

highest permitted peak voltage across any insulation under open-circuit condition and any normal and abnormal operating conditions

The maximum peak voltage is related to the declared r.m.s. working voltage; see Table 1.

### 3.4

#### **minimum value of lamp power (of a controllable control gear)**

lowest percentage of the lamp power defined in 3.2 declared by the manufacturer or responsible vendor

### 3.5

#### **a.c./d.c. supplied electronic control gear for maintained emergency lighting**

mains/battery-supplied a.c./d.c. to a.c. inverter including stabilizing elements for starting and operating one or more fluorescent lamps, generally at high frequency for emergency lighting

### 3.6

#### **cathode dummy resistor**

cathode substitution resistor as specified on the relevant lamp data sheet of IEC 60081 or IEC 60901 or as declared by the relevant lamp manufacturer or by the responsible vendor

### 3.7

#### **d.c. supplied electronic control gear**

d.c. supplied electronic control gear or inverter includes stabilisation elements for starting and operating one or more tubular fluorescent lamps, generally at high frequency

## 4 General requirements

The requirements of Clause 4 of IEC 61347-1 apply, together with the following additional requirement:

AC/d.c. electronic control gear for emergency lighting shall comply with the requirements of Annex J.

## 5 General notes on tests

The requirements of Clause 5 of 61347-1 apply together with the following additional requirement:

The following number of specimens shall be submitted for testing:

- one unit for the tests of Clause 6 to 12 and 15 to 22;
- 12 samples with each one or more units for the test of Clause 14, refer to IEC 61347-1, 14.5 (additional units or components, where necessary, may be required in consultation with the manufacturer).

Tests to meet the safety requirements for a.c./d.c. supplied electronic control gear for emergency lighting are made under the conditions specified in Annex J.

## 6 Classification

The requirements of Clause 6 of IEC 61347-1 apply.

## 7 Marking

Control gear which forms an integral part of the luminaire need not be marked.

### 7.1 Mandatory markings

In accordance with the requirements of 7.2 of IEC 61347-1, control gear, other than ~~integral~~ **integrated** controlgear, shall be clearly and durably marked with the following mandatory markings:

- items a), b), c), d), e), f), k), l), m), s), t) and u) of 7.1 of IEC 61347-1, ~~together with~~ (hereby item s) in 7.1 has priority over the requirements of SELV controlgear in Table L.1);
- according to 15.4, the declaration of  $U_{out}$  can be based on a reduced number of measurements.
- ~~– the symbol for earthing, as applicable;~~
- ~~– for controllable control gear, the control terminals shall be identified;~~
- ~~– a declaration of the maximum working voltage (r.m.s.) according to 12.2 between~~
  - ~~• output terminals;~~
  - ~~• any output terminal and earth.~~

~~Marking for each of these two values shall be in steps of 10 V when the working voltage is equal to, or less than, 500 V, and in steps of 50 V when the working voltage is higher than 500 V. The marking of maximum working voltage is referenced in two situations, the maximum between output terminals and the maximum between any output terminal and earth. It is acceptable for only the higher of these two voltages to be marked.~~

~~Marking shall be U<sub>OUT</sub> = ... V.~~

### 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 n)** given in 7.1 of IEC 61347-1;
- information regarding voltage polarity reversal protection for d.c. supplied controlgear only.

## 8 Protection against accidental contact with live parts

The requirements of Clause 10 of IEC 61347-1 apply.

## 9 Terminals

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

## 10 Provisions for earthing

The requirements of Clause 9 of IEC 61347-1 apply.

## 11 Moisture resistance and insulation

The requirements of Clause 11 of IEC 61347-1 apply together with the following additional requirements:

The leakage current that may occur from contact with fluorescent lamps operated at high frequency from a.c. supplied electronic control gear shall not exceed the values in Figure 5 when measured in accordance with Annex I. The values are in r.m.s. values.

The limits of leakage current values for frequencies between the values shown in Figure 5 should be obtained by calculation according to the formula in the figure (under consideration).

NOTE Limits of leakage current values for frequencies above 50 kHz are under consideration.

*Compliance with these requirements is checked in accordance with Annex I.*

## 12 Electric strength

The requirements of Clause 12 of IEC 61347-1 apply.

## 13 Thermal endurance test for windings

The requirements of Clause 13 of IEC 61347-1 do not apply.

## 14 Fault conditions

The requirements of Clause 14 of IEC 61347-1 apply.

An additional fault condition to be applied to d.c. supplied control gear is the supply voltage polarity shall be reversed.

## 15 Protection of associated components

### 15.1 Maximum peak voltage under normal operation conditions

Under conditions of normal operation, verified with dummy cathode resistors inserted and conditions of abnormal operation, as specified in Clause 16, the voltage at the output terminals shall at no time exceed the maximum permitted peak value specified in Table 1.