IEC 61347-2-3

Edition 3.0 2024-05

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Controlgear for electric light sources – Safety – Part 2-3: Particular requirements – AC or DC supplied electronic controlgear for fluorescent lamps

Appareillages de commande pour les sources de lumière électriques – Sécurité – Partie 2-3: Exigences particulières – Appareillages électroniques alimentés en courant alternatif ou en courant continu pour lampes fluorescentes

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IEC 61347-2-3:2024-05(en-fr)

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CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –

Part 2-3: Particular requirements – AC or DC supplied electronic controlgear for fluorescent lamps

FOREWORD

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IEC 61347-2-3 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lighting. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011 and Amendment 1:2016. This edition constitutes a technical revision.

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

a) introduction of dated references where appropriate;
b) clarification of sample item numbers;
c) alignment of clause numbers with those of IEC 61347-1.

The text of this International Standard is based on the following documents:

Draft	Report on voting
34C/1586/CDV	34C/1594/RVC

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

This document is intended to be used in conjunction with IEC 61347-1:2015 and IEC 61347-1:2015/AMD1:2017. Where the requirements of any of the clauses of IEC 61347-1:2015 and IEC 61347-1:2015/AMD1:2017 are referred to in this document by the phrase "IEC 61347-1:2015, Clause n and IEC 61347-1:2015/AMD1:2017, Clause n apply", this phrase is interpreted as meaning that all the requirements of the clause in question of IEC 61347-1:2015 and IEC 61347-1:2015/AMD1:2017 apply, except any which are clearly inapplicable to the specific type of controlgear covered by this document.

NOTE In this document, the following print type is used:

– *compliance statements: in italic type*.

A list of all parts in the IEC 61347 series, published under the general title *Controlgear for electric light sources – Safety,* can be found on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

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The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

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INTRODUCTION

The technical requirements in this document compared to IEC 61347-2-3:2011 and IEC 61347-2-3:2011/AMD1:2016 are essentially unchanged. Nevertheless, a new edition of this document could not be avoided, as without the introduction of dated references to IEC 61347-1:2015 and IEC 61347-1:2015/AMD1:2017, the fourth edition of IEC 61347-1:—[1] would have been implicitly applicable due to the undated nature of the references to IEC 61347-1 in IEC 61347-2-3:2011 and IEC 61347-2-3:2011/AMD1:2016.

This document, in referring to any of the clauses of IEC 61347-1:2015 and IEC 61347-1:2015/AMD1:2017, specifies the extent to which such a clause is applicable. Additional requirements are also included, as necessary.

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[1] Fourth edition under preparation. Stage at the time of publication IEC FDIS 61347-1:2024.

CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –

Part 2-3: Particular requirements – AC or DC supplied electronic controlgear for fluorescent lamps

1 Scope

This part of IEC 61347 specifies safety requirements for electronic controlgear for use on AC supplies at 50 Hz or 60 Hz up to 1 000 V or on DC supplies up to 1 000 V with lamp operating frequencies deviating from the supply frequency, associated with fluorescent lamps as specified in IEC 60081 and IEC 60901, low-pressure UV lamps, and other fluorescent lamps for high-frequency operation.

NOTE 1 Requirements for centrally supplied controlgear for emergency lighting are given in Annex B. This also includes performance requirements as far as they are considered to be safety-related with respect to reliable emergency operation.

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

NOTE 3 Performance requirements are the subject of IEC 60929.

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2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 61347-2-3:2024
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IEC 60081:1997, *Double-capped fluorescent lamps – Performance specifications*
IEC 60081:1997/AMD1:2000
IEC 60081:1997/AMD2:2003
IEC 60081:1997/AMD3:2005
IEC 60081:1997/AMD4:2010
IEC 60081:1997/AMD5:2013
IEC 60081:1997/AMD6:2017

IEC 60901:1997, *Single-capped fluorescent lamps – Performance specifications*
IEC 60901:1997/AMD1:1997
IEC 60901:1997/AMD2:2000
IEC 60901:1997/AMD3:2004
IEC 60901:1997/AMD4:2007
IEC 60901:1997/AMD5:2011
IEC 60901:1997/AMD6:2014

IEC 60929:2011, *AC and/or DC-supplied electronic control gear for tubular fluorescent lamps – Performance requirements*
IEC 60929:2011/AMD1:2015

IEC 61347-1:2015, *Lamp controlgear – Part 1: General and safety requirements*
IEC 61347-1:2015/AMD1:2017

IEC 61347-2-7:2011, *Lamp controlgear – Part 2-7: Particular requirements for electric source for safety services (ESSS) supplied electronic controlgear for emergency lighting (self-contained)*
IEC 61347-2-7:2011 /AMD1:2017
IEC 61347-2-7:2011 /AMD2:2021

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

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
- ISO Online browsing platform: available at https://www.iso.org/obp

3.1
AC supplied electronic controlgear
mains-supplied AC to AC invertor including stabilizing elements for starting and operating one or more fluorescent lamps, generally at high frequency

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3.2
maximum allowed peak voltage
highest permitted peak voltage across any insulation of the output under open-circuit condition and any normal and abnormal operating conditions

Note 1 to entry: The maximum allowed peak voltage is related to the declared RMS working voltage; see Table 1.

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3.3
dummy cathode 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

3.4
DC supplied electronic controlgear
DC-supplied invertor including stabilization elements for starting and operating one or more tubular fluorescent lamps, generally at high frequency

3.5
sample
one or more sampling items intended to provide information on the population or on the material provided by the manufacturer or responsible vendor

[SOURCE: IEC 60050-151:2001, 151-16-19, modified – "provided by the manufacturer or responsible vendor" has been added.]

3.6
sample item
one of the individual items in a population of similar items, or a portion of material forming a cohesive entity and taken from one place and at one time

[SOURCE: IEC 60050-151:2001, 151-16-18]

3.7
emergency lighting
lighting provided for use when the supply to the normal lighting fails

Note 1 to entry: Emergency lighting includes escape lighting and standby lighting.

3.8
rated emergency power supply voltage
rated voltage of the emergency power supply claimed by the manufacturer for the information of the installer or user

3.9
starting aid
device which facilitates the starting of the lamp

EXAMPLE A conductive strip affixed to the outer surface of the lamp and a conductive plate which is spaced within an appropriate distance from a lamp.

3.10
emergency ballast lumen factor
EBLF
ratio of the emergency luminous flux of the lamp supplied by the emergency controlgear to the luminous flux of the same lamp operated with the appropriate reference ballast at its rated voltage and frequency

Note 1 to entry: The emergency ballast lumen factor is the minimum of the values measured at the appropriate time after failure of the normal supply and continuously.

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3.11
preheat starting
circuit in which the lamp electrodes are brought to emission temperature before the lamp actually ignites

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3.12
non-preheat starting
circuit which utilizes a high open-circuit voltage causing field emission from the electrode

4 General requirements

IEC 61347-1:2015, Clause 4 applies, together with the following:

– For G5-capped lamps with a diameter of 16 mm, the working voltage between any output terminal and earth shall not exceed 430 V (RMS).

NOTE 1 This requirement is in accordance with IEC 61195:1999, Annex E.

– For centrally supplied controlgear for emergency lighting Annex B applies.

NOTE 2 This includes AC, AC/DC and DC supplied types.

EXAMPLE Central battery systems and generator-based systems.

– For controlgear with means of protection against overheating IEC 61347-1:2015, Annex C applies.

5 General notes on tests

IEC 61347-1:2015, Clause 5 applies, together with the following:

– IEC 61347-1:2015, Annex H applies.

– One sample item shall be used for all tests, unless otherwise specified in the corresponding clause.

  To allow for parallel testing and reduced test times, additional sample items may be used except where the outcome of the test can be affected by preceding tests, for example the tests of Clause 11 and Clause 12.

  Specially prepared sample items may be used where required.

– Tests to meet the safety requirements for electronic controlgear for emergency lighting shall be performed under the conditions specified in Annex B.

For information on requalification of products compliant with the previous edition of this document, i.e. IEC 61347-2-3:2011 and IEC 61347-2-3:2011/AMD1:2016, refer to Annex D.

6 Classification

IEC 61347-1:2015, Clause 6 applies.

7 Marking

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7.1 Marking and information

7.1.1 Mandatory marking

Controlgear, other than integral controlgear, shall be marked with the following:

– items a), b), c), d), e), f), k), l), m), t) and u) of IEC 61347-1:2015, 7.1 and IEC 61347-1:2015/AMD1:2017, 7.1;

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– item s) of IEC 61347-1:2015, 7.1 and IEC 61347-1:2015/AMD1:2017, 7.1;

  This item has priority over the requirements of SELV controlgear in IEC 61347-1:2015, Table L.1 and IEC 61347-1:2015/AMD1:2017, Table L.1;

According to 15.4, the declaration of U_{out} may be based on a reduced number of measurements.

7.1.2 Information to be provided

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) of IEC 61347-1:2015, 7.1;

– for DC supplied controlgear: information regarding voltage polarity reversal protection.

7.2 Durability and legibility of markings

IEC 61347-1:2015, 7.2 applies.

7.3 Built-in controlgear

For controlgear without an enclosure and classified as built-in (e.g. open printed circuit board assembly), only items a) and b) of IEC 61347-1:2015, 7.1 shall be marked on the controlgear.

Other mandatory markings shall be provided as information to be given either on the controlgear, or made available in the manufacturer's catalogue or similar.

8 Terminals

IEC 61347-1:2015, Clause 8 and IEC 61347-1:2015/AMD1:2017, Clause 8 apply.

9 Earthing

IEC 61347-1:2015, Clause 9 applies.

10 Protection against accidental contact with live parts

IEC 61347-1:2015, Clause 10 and IEC 61347-1:2015/AMD1:2017, Clause 10 apply.

11 Moisture resistance and insulation

IEC 61347-1:2015, Clause 11 and IEC 61347-1:2015/AMD1:2017, Clause 11 apply, together with the following:

The leakage current that can occur from contact with fluorescent lamps operated at high frequency from AC supplied electronic controlgear shall not exceed the values in Figure 5 when measured in accordance with Annex A. The values are RMS values.

Compliance with these requirements is checked in accordance with Annex A.

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12 Electric strength

IEC 61347-1:2015, Clause 12 applies.

13 Thermal endurance test for windings of ballasts

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There are no requirements.

NOTE The requirements of IEC 61347-1:2015, Clause 13 are not applicable.

14 Fault conditions

IEC 61347-1:2015, Clause 14 and IEC 61347-1:2015/AMD1:2017, Clause 14 apply.

For DC supplied controlgear, reversed polarity of the supply voltage shall be tested as additional fault condition.

15 Protection of associated components

15.1 Maximum allowed 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 allowed peak voltage specified in Table 1.

Table 1 – Relation between RMS working voltage and maximum allowed peak voltage

Voltage at output terminals	
RMS working voltage V	**Maximum allowed peak voltage** V
250	2 200
500	2 900
750	3 100
1 000	3 200
Linear interpolation between the given voltage steps is allowed.	

15.2 Maximum working voltage under normal and abnormal operating conditions

Under normal operating conditions and abnormal operating conditions as specified in Clause 16, except for the rectifying effect, and from 5 s after the switch-on or beginning of the starting process, the voltage at the output terminals shall not exceed the maximum working voltage for which the controlgear is declared.

15.3 Maximum working voltage and rectifying effect

In the case of a rectifying effect, i.e. abnormal operating conditions according to 16.1 d), the RMS voltage at the output terminal shall not exceed the maximum permitted value for which the controlgear is designed for a period longer than 30 s after switch-on, or beginning of the starting process.

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For controlgear which make more than one attempt to start a failed lamp, the combined duration of voltages above the maximum working voltage for which the controlgear is declared shall not exceed 30 s.

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Circuit for testing the rectifying effect and the information regarding the recovery time t_{rr} of the diode are given in Figure 4 a), Figure 4 b) and Figure 4 c).

15.4 Output voltage and abnormal conditions

For the tests of 15.1 and 15.2, the output voltages measured shall be those between any output terminal and earth. Additionally, voltages that appear between output terminals shall be measured in cases where the voltage is present across insulation barriers within associated components.

For multi-lamp or multi-power controlgear, only the combination that leads to the highest voltage shall be measured.

If, from a similar review or declaration for all controlgear, it becomes clear that the voltage is below 50 V, then only that terminal-terminal or terminal-earth combination is measured.

15.5 Isolation of input terminals of controllable electronic controlgear

For controllable electronic controlgear, the control input shall be isolated from the mains circuit by insulation at least equal to basic insulation.

NOTE This requirement does not apply to those controlgear where control signals are injected via the supply terminals or where the control signals are completely isolated from the controlgear by being transmitted remotely from infra-red or radio wave transmitters.

If SELV is to be used, then double or reinforced insulation is required.