

INTERNATIONAL STANDARD



~~Lamp controlgear~~ –
Controlgear for electric light sources – Safety –
Part 2-12: Particular requirements – DC or AC supplied electronic ~~ballasts~~
controlgear for discharge lamps (excluding fluorescent lamps)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

~~LAMP CONTROLGEAR~~ CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –

Part 2-12: Particular requirements – DC or AC supplied electronic ~~ballasts~~ controlgear for discharge lamps (excluding fluorescent lamps)

FOREWORD

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This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61347-2-12:2005+AMD1:2010 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 61347-2-12 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lighting. It is an International Standard.

This second edition cancels and replaces the first edition published in 2005 and Amendment 1:2010. 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) addition of new information requirements (items v), w) and x) of IEC 61347-1:2015, 7.1 and IEC 61347-1:2015/AMD1:2017, 7.1).

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

Draft	Report on voting
34C/1585/CDV	34C/1593/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.

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

~~This standard, and the parts which make up IEC 61347-1, 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.~~

~~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 controlgear covered by this particular part of IEC 61347-2.~~

The technical requirements in this document compared to IEC 61347-2-12:2005 and IEC 61347-2-12:2005/AMD1:2010 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 61347-2-12:2005 and IEC 61347-2-12:2005/AMD1:2010.

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.

~~LAMP CONTROLGEAR –~~ CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –

Part 2-12: Particular requirements – DC or AC supplied electronic ~~ballasts~~ controlgear for discharge lamps (excluding fluorescent lamps)

1 Scope

~~This part of IEC 61347 specifies particular general and safety requirements for d.c. or a.c. supplied electronic ballasts. The supply comprises a.c. voltages up to 1000 V at 50 Hz/60 Hz.~~ 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 DC supplies up to 1 000 V. The type of ~~ballast~~ controlgear is a convertor that ~~may~~ can contain igniting and stabilizing elements for operation of a discharge lamp under direct current or at a frequency that can deviate from the supply frequency.

NOTE Lamps associated with ~~the ballast~~ this type of controlgear are specified in IEC 60188 (High pressure mercury vapour lamps), IEC 60192 (Low pressure sodium vapour lamps), IEC 60662 (High pressure sodium vapour lamps), IEC 61167 (Metal halide lamps) and else for general purpose lighting. ~~Ballasts for fluorescent lamps and for lamps for special applications like for theatre and for vehicles are excluded.~~

Controlgear for fluorescent lamps and for lamps for special applications such as theatre and vehicles are excluded.

2 Normative references

~~For the purpose of this part of IEC 61347, the normative references given in Clause 2 of IEC 61347-1 apply together with the following:~~

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 60052:2002, *Voltage measurement by means of standard air gaps*

IEC 60417-DB²⁾, *Graphical symbols for use on equipment*, available at <https://www.graphical-symbols.info/equipment>

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

IEC 61347-2-1:2024, *Controlgear for electric light sources – Safety – Part 2-1: Particular requirements for starting devices (other than glow starters)*

3 Terms and definitions

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

²⁾ "DB" refers to the IEC on-line database.

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~~

~~output power~~

~~value of the mean power intended to be provided by an electronic ballast~~

3.1

output terminal

~~ballast~~ controlgear terminal, intended to be connected to a high intensity discharge lamp (HID lamp)

Note 1 to entry: This terminal is not understood as a terminal allowing for intermediate operation of e.g. tungsten halogen lamps.

3.2

ignition voltage

U_p

highest value of the voltage generated between the output terminals

Note 1 to entry: Basically, the following types of pulses are ~~comprised~~ taken into consideration:

- a) continuous RMS working voltage with superimposed non-sinusoidal single pulse;
- b) continuous sinusoidal pulse voltage;
- c) continuous sinusoidal pulse voltage with superimposed non-sinusoidal single pulse;
- d) continuous square wave voltage with ringing sinusoidal voltage at each transition.

Note 2 to entry: The term "pulse" is to be distinguished from the term "surge" which refers to transients occurring in electrical equipment or networks in service.

3.3

spherical spark gap

two metal spheres of the same ~~nominal~~ diameter arranged at a specified distance and used under specified conditions for the measurement of peak voltages in excess of 15 kV

3.4

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.]

3.5

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]

4 General requirements

IEC 61347-1:2015, Clause 4 applies.

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

5 General notes on tests

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

~~5.1~~ ~~Number of specimens~~

~~The following number of specimens shall be submitted for testing:~~

- ~~— one unit for the tests of Clauses 6 to 12 and 15 to 22;~~
- ~~— one unit for the tests of Clause 14: fault conditions (additional units or components, where necessary, may be required in consultation with the manufacturer).~~

~~5.2~~ ~~Void.~~

- 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.

For information on requalification of products compliant with the previous edition of this document, i.e. IEC 61347-2-12:2005 and IEC 61347-2-12:2005/AMD1:2010, refer to Annex B.

6 Classification

~~The requirements of Clause 6 of IEC 61347-1 apply together with the following additional requirement:~~

~~6.1~~ ~~Ignition voltage~~

~~Ballasts are classified according to ignition voltage:~~

- ~~— up to and including 5 kV;~~
- ~~— greater than 5 kV, and up to and including 10 kV;~~
- ~~— greater than 10 kV, and up to and including 100 kV.~~

~~6.2~~ ~~Void.~~

IEC 61347-1:2015, Clause 6 applies.

7 Marking

~~Ballasts which form an integral part of the luminaire need not be marked. The requirements of 7.2 of IEC 61347-1 apply.~~

7.1 Marking and information

7.1.1 Mandatory marking

~~Ballasts~~ Controlgear, other than integral ~~ballasts~~ controlgear, shall be ~~clearly and durably marked, in accordance with the requirements of 7.1 of IEC 61347-1,~~ with the following mandatory markings:

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

- ~~— for controllable ballasts, the control terminals shall be identified;~~
- ~~— output terminals shall be identified as such;~~
- ~~— the value of the ignition voltage (16), if it exceeds 1 500 V. Connections having this voltage shall be marked; for ballasts with an ignition voltage over 5 kV, this marking shall be a flash symbol, see IEC 60417-5036 (DB:2002-10);~~
- a marking identifying the output terminals;
- if the ignition voltage (Clause 16) exceeds 1 500 V:
 - value of the ignition voltage;
 - a marking identifying the terminals having this voltage;
 - for controlgear with an ignition voltage exceeding 5 kV, a flash symbol, in accordance with IEC 60417-5036:2002-10;
- a declaration of the maximum working voltage (RMS) according to Clause 15 between
 - output terminals;
 - any output terminal and earth, if applicable.

The specification of each of these values shall be given in the manufacturer's description 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 highest of the specified voltage values shall be marked on the ~~ballast~~ controlgear as "output working voltage = xx V" (or "U-OUT = xx V").

In the case of a controlgear consisting of more than one separate unit, a marking on all parts such that the matching components can be identified clearly.

7.1.2 Information to be provided, if applicable

~~In addition to the above mandatory markings,~~ The following information, if applicable, shall be given either on the ~~ballast~~ controlgear, ~~if declared below,~~ or be made available in the manufacturer's catalogue or the like:

- items h), i), j), m) n), v), w) and x) of IEC 61347-1:2015, 7.1 and IEC 61347-1:2015/AMD1:2017, 7.1;
- ~~— in the case of a ballast consisting of more than one separate unit, all parts have to be marked such that the matching components can be identified clearly;~~
- warning to the installer to prevent overheating of ~~ballasts~~ controlgear and associated components in a multi-~~ballast~~ controlgear installation mounted in poles, boxes, etc.;
- an indication of the time limitation of ignition voltage
- ~~— If the control terminal is not basic insulated from the mains, this shall be indicated on the ballast.~~

7.2 Durability and legibility

IEC 61347-1:2015, 7.2 applies.

7.3 Built-in controlgear

For controlgear without enclosure and classified as built-in (e. g. open printed circuit board assemblies), 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 ~~Provisions for~~ 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.

12 Electric strength

IEC 61347-1:2015, Clause 12 applies.

13 Thermal endurance test for windings

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.

15 Protection of associated components

The output voltages measured shall be those between all output terminals and any output terminal and earth.

Under normal and abnormal operating conditions none of these output voltages shall exceed the working voltage as declared by the manufacturer. The ignition phase being defined by switch-on or by the beginning of the ignition process up to the time limit as given in Clause 16 is exempted.

Under normal and abnormal (see Clause 17) conditions, if a time limitation is declared for ignition, it shall not be exceeded.

~~15.3 For controllable electronic ballasts, the control terminal shall be isolated from the mains circuit by an insulation at least equal to basic insulation unless otherwise indicated, see 7.2.~~

16 Ignition voltage

16.1 Instruments

Measurements are made by oscilloscope or electrostatic voltmeters for ignition voltages up to 100 kV.