IEC 61347-2-7

Edition 3.1 2017-10
CONSOLIDATED VERSION

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

Appareillages de lampes –
Partie 2-7: Règles particulières relatives aux appareillages électroniques alimentés par batterie pour l'éclairage de secours (autonome)

IEC 61347-2-7:2011-12+AMD1:2017-10 CSV(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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LAMP CONTROLGEAR –

Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)

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.

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

IEC 61347-2-7 edition 3.1 contains the third edition (2011-12) [documents 34C/995/FDIS and 34C/1002/RVD] and its amendment 1 (2017-10) [documents 34C/1354/FDIS and 34C/1359/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 61347-2-7 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

This third edition constitutes a technical revision.

Significant changes introduced into this third edition include:

- modification of IEC 61347-2-7 to become a standard exclusively for d.c. battery supplied electronic controlgear for emergency lighting (self-contained). IEC 61347-2-3 Annex J is intended to cover centrally supplied emergency controlgear;
- update of Clause 22 – Recharging devices;
- modification of Clause 20 battery voltage characterisation to support EBLF measurement. This to simplify and increase reproducibility of testing;
- rationalisation of requirements between IEC 61347-2-7 and IEC 60598-2-22 requirements of IEC 60598-2-22 being transferred to IEC 61347-2-7.

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

This standard shall be used in conjunction with IEC 61347-1. This part 2 supplements or modifies the corresponding clauses in IEC 61347-1.

NOTE 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 of the IEC 61347 series, published under the general title *Lamp controlgear,* 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.

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INTRODUCTION

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 reference 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.

INTRODUCTION to Amendment 1

EBLF is the ratio of the light output of a light source in emergency mode to the rated light output under normal conditions. EBLF is controlled by the output characteristics (current, voltage, power) of the controlgear with which the light source is operated.

For conventional lamps like fluorescent lamps, the EBLF is defined by the light output ratio of the lamp operated at 100 % and in emergency mode.

$$\text{EBLF} = \Phi_{\text{emergency}} / \Phi_{100\ \%}$$

For this measurement no special lamp is required, it is expected that all lamps of the same type show a very similar light output ratio independent of its manufacturer. The measurement is done at an ambient temperature of 25 °C. Due to the same dimensions and the identical cooling system (free air) the thermal conditions are identical for all lamps. The result is fully reproducible without any additional condition.

Special requirements for LED light sources

The light output of LED light sources depends also on the temperature at which they are operated. Typically the temperature is controlled by a heat sink on which it is mounted (e.g. luminaire surface).

This amendment describes a test method to evaluate the EBLF via an output factor (EOF_X) taking into account that the ratio of the forward current of the LED controlgear is directly proportional to the LED light output. Any non-linearity due to the increased efficacy at lower operation temperature leads to an increased tolerance of the light output in the emergency mode but always positive.

Controlgear, which operates the LED light source in normal operation as well as in emergency operation can be marked directly with the output factor. Controlgear, operating the LED module in emergency mode only needs to be marked with the output value, for example the forward current $I_{\text{emergency}}$.

LAMP CONTROLGEAR –

Part 2-7: Particular requirements for battery supplied electronic controlgear for emergency lighting (self-contained)

1 Scope

This part of IEC 61347 specifies particular safety requirements for battery supplied electronic controlgear for maintained and non-maintained emergency lighting purposes.

It includes specific requirements for electronic controlgear and control units for self-contained luminaires for emergency lighting as specified by IEC 60598-2-22.

It is intended for controlgear for fluorescent lamps, but it is also applicable to other lamp types e.g. incandescent, high pressure discharge lamps and LEDs.

This standard covers the emergency mode operation of a controlgear. For controlgear with a combination of normal and emergency lighting operation, the normal lighting operation aspects are covered by the appropriate part 2 of IEC 61347.

DC supplied electronic controlgear for emergency lighting may or may not include batteries.

~~This standard also includes operational requirements for electronic controlgear, which, in the case of d.c. supplied electronic controlgear, are regarded as performance requirements. This is because non-operational emergency lighting equipment presents a safety hazard. It~~ This standard does not apply to d.c. supplied electronic controlgear for emergency lighting, which are intended for connection to a centralised emergency power supply system. A centralised emergency power system could be a central battery system.

NOTE Annex J of IEC 61347-2-3 applies to a.c., a.c./d.c. or d.c. supplied electronic controlgear for connection to centralised emergency power supply systems that are also intended for emergency lighting operations from a.c./d.c. supplies.

2 Normative references

For the purpose of this part of IEC 61347, 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 60081, *Double-capped fluorescent lamps – Performance specifications*

IEC 60598-2-22*, Luminaires – Part 2: Particular requirements – Luminaires for emergency lighting*

IEC 60901, *Single-capped fluorescent lamps – Performance specifications*

IEC 60921, *Ballasts for tubular fluorescent lamps – Performance requirements*

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

IEC 61347-1, *Lamp controlgear – Part 1: General and safety requirements*

IEC 61347-2-3, *Lamp control gear – Part 2-3: Particular requirements for a.c. and/or d.c. supplied electronic control gear for fluorescent lamps*

IEC 61558-1:2005, *Safety of power transformers, power supplies, reactors and similar products – Part 1: General requirements and tests*
Amendment 1 (2009)[1]

IEC 61558-2-1:2007, *Safety of power transformers, power supply units and similar products– Part 2-1: Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications*

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*

IEC 62034, *Automatic test systems for battery powered emergency escape lighting*

3 Terms and definitions

For the purposes of this part of IEC 61347, the terms and definitions of Clause 3 of IEC 61347-1 and Clause 22.3 in IEC 60598-2-22 apply, together with the following:

3.1
emergency lighting
lighting provided for use when the supply to the normal lighting fails

3.2
changeover operation
automatic connection of the lamp to emergency lighting supply when failure of the normal lighting supply occurs, and connecting automatically back to the normal lighting supply when it is restored

3.3
recharging device
device to maintain the battery charge and to recharge the battery within a specified time

3.4
protection device against extensive discharge
automatic device to disconnect the ~~ballast~~ controlgear from the battery when the battery voltage drops below a certain value

3.5
rated duration of emergency operation
time, as claimed by the manufacturer, for which the rated emergency ballast lumen factor is achieved

3.6
maximum d.c. operating voltage
maximum supply voltage declared by the controlgear manufacturer

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1 There exists a consolidated edition 2.1 (2009) comprising IEC 61558-1 (2005) and its Amendment 1 (2009).

For battery supplied controlgear, this is the maximum battery voltage available in the fully charged condition.

3.7
rated d.c. operating voltage
nominal supply voltage declared by the controlgear manufacturer

For battery supplied controlgear, this is the nominal battery voltage declared by the battery manufacturer.

3.8
d.c. voltage range
voltage range between minimum and maximum rated d.c. operating voltages

3.9
rated a.c. operating voltage
nominal supply voltage declared by the controlgear manufacturer for battery charger or maintained controlgear operation

3.10
a.c. voltage range
voltage range between minimum and maximum rated a.c. operating voltages

3.11
remote control
device to prevent discharge of the battery by the lamp operating circuit when normal illumination has been switched off centrally, e.g. during night-time

3.12
indicator
device to indicate that:

a) the battery is being charged,
b) circuit continuity exists through the tungsten filament of emergency lighting lamps where appropriate

3.13
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

The emergency ballast lumen factor is the minimum of the values measured at the appropriate time after failure of the normal supply and continuously to the end of the rated time duration.

3.14
control unit
unit or units comprising a supply change-over system, a battery charging device and where appropriate, a means for testing

3.15
automatic test function
~~an automatic testing~~ function for emergency lighting operation as covered by IEC 62034

3.16
emergency output factor
EOF_X
ratio of the electrical output parameter when the controlgear under test is operated in emergency mode to the electrical output parameter when the controlgear is operated under normal lighting conditions

EXAMPLE: $I_{emergency}$ compared with I_{rated} according to IEC 61347-2-13.

Note 1 to entry: The electrical output parameter can be current (EOF_I), voltage (EOF_U) or power (EOF_P) at the output(s) of the controlgear (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 value measured at the appropriate time after failure of the normal supply and continuously for the duration of the emergency operation.

Note 3 to entry: The EOF_X of LED controlgear used for emergency operation only, is not indicated on the emergency controlgear as it depends directly also on the controlgear used for the normal operation mode. For example for EOF_I it can be calculated in the final application from $I_{emergency}$ and $I_{normal\ mode}$.

Note 4 to entry: The use of EOF_I higher than 1 is not suitable for direct calculation of the luminous flux of the luminaire in emergency mode.

3.17
emergency output current
$I_{emergency}$
forward current supplied to the LED light source measured at the output of the controlgear in emergency mode

3.18
$I_{normal\ mode}$
rated output current delivered from constant current controlgear to the LED light source in normal operating mode

4 General requirements

The requirements of Clause 4 of IEC 61347-1 apply.

For controlgear that are rated for operation of a range of lamp types, the tests of Clauses 15, 16, 17, 18, 19, 20, 22 and 34 shall be repeated with each rated lamp type. For other tests, the lamp type having the highest rated power should be selected.

For controlgear incorporating an automatic test function, the relevant requirements of IEC 62034 as defined in Annex K of this standard apply.

5 General notes on tests

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

Number of specimens:

The following number of specimens shall be submitted for testing:

– 1 unit for the tests of Clauses 6 to 12, 15 to 27 and 29 to 34;
– 3 units may be used for the tests of Clause 15 to reduce the time test;
– 1 unit for the test of Clause 28, fault conditions (additional units or components, where necessary, may be required in consultation with the manufacturer);