

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



Lamp controlgear – **STANDARD PREVIEW**  
Part 2-7: Particular requirements for battery supplied electronic controlgear for  
emergency lighting (self-contained)  
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Appareillages de lampes – [IEC 61347-2-7:2011](https://standards.iteh.ai/catalog/standards/sist/02c3728b-6930-41e9-a5c3-)  
Partie 2-7: Règles particulières relatives aux appareillages électroniques  
alimentés par batterie pour l'éclairage de secours (autonome)



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# INTERNATIONAL STANDARD

# NORME INTERNATIONALE



**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)**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

PRICE CODE  
CODE PRIX



ICS 29.140.99

ISBN 978-2-88912-830-3

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**LAMP CONTROLGEAR –**

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

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International Standard IEC 61347-2-7 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lamps and related equipment.

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

FDIS	Report on voting
34C/995/FDIS	34C/1002/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 third edition cancels and replaces the second edition published in 2006. It 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 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

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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.

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## 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 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)<sup>1</sup>

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

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#### 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 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

<sup>1</sup> 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:

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- 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

## 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);
- where required new batteries of the type and make provided with the controlgear, or typical of the type specified by the controlgear manufacturer, shall be submitted.

Unless otherwise specified, the battery voltage shall be measured between the controlgear terminals.

For controlgear incorporating an automatic testing function, the controlgear supplied for test shall be provided with all additional system components and any external software that is required to verify correct operation of the automatic testing function.

## 6 Classification

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

In addition controlgear shall be classified according to the incorporation of an automatic testing function for emergency lighting operation, in accordance with IEC 62034:

- with automatic test function,
- without automatic test function.

## 7 Marking

### 7.1 Items to be marked

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

- items a), b), c), d), e), f), k) and l) of 7.1 of IEC 61347-1, together with open circuit voltage (for warning only, not to be tested);
- controlgear without an enclosure are only required to be marked with items a) and b) of Clause 7.1 if IEC 61347-1;
- indication of type and current rating of the fuse, if applicable;
- electronic controlgear complying with this standard shall be marked with the following symbol:



- controlgear classified as being provided with an automatic test function shall be marked with the symbol



- a declaration of the maximum working voltage (r.m.s.) according to Clause 35 between
  - output terminals;
  - any output terminal and earth, if applicable.

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-OUT=...V..

## 7.2 Information to be provided

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

NOTE 1 For integral controlgear, the requirements of this subclause may be met by the provision of equivalent information required by IEC 60598-2-22.

- items h), i), j), and n) of 7.1 of IEC 61347-1, together with
- mention of whether the ballast is suitable for use only on battery supply not having a trickle or intermittent re-charging circuits;
- rated duration of emergency operation for each lamp capable of being operated by the ballast;
- information whether the controlgear is intended for use in luminaries for high-risk task area lighting;
- mention of whether the controlgear is proof against supply voltage polarity reversal;
- emergency ballast lumen factor for each lamp capable of being operated by the ballast;
- limits of the ambient temperature range within which the ballast will start and operate the lamp as intended over the declared voltage range. If the battery or other parts of the controlgear have different limits, these values are to be declared;
- the manufacturer shall declare the type of insulation used between the supply and the battery circuit (e.g. no insulation, basic insulation or double/reinforced insulation);
- information on whether the recharging device will recharge the battery normally after the test of 22.3 (example: by incorporation of self-resetting replaceable fuse) or fail (example: by incorporation of single operation protection device);
- supply current from battery at rated d.c. operating voltage for each lamp capable of being operated by the ballast;
- information required for correct battery selection. This to include:
  - technology of the battery (e.g. NiCd, NiMH, etc.);
  - type designation of the battery according to the relevant standard (e.g. temperature classification, etc.);
  - capacity and voltage of the battery;
  - information about the charge rating of the controlgear (maximum and minimum charge current and voltage limits);

- information about the discharge rating request by the controlgear (maximum and minimum discharge current and voltage limits);
- temperature rating to provide the controlgear performances;

NOTE 2 All electrical data are based on 25 °C reference conditions.

NOTE 3 Reference to a battery type and manufacturer is also acceptable.

- information regarding the installation, commissioning and use of controlgear having an automatic testing function.

## 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 protective 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.

## 12 Electric strength

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

## 13 Thermal endurance test for windings of ballasts

The requirements of Clause 13 of IEC 61347-1 are not applicable.

## 14 Fault conditions

Not applicable.

## 15 Starting conditions

The ballast/control unit shall be designed so that the appropriate lamp(s) achieve sufficient switchings.

*Compliance is checked by the following test:*

*Three new lamps shall achieve 200 switchings when operated at the rated operating voltage in a cycle: 30 s “on”, 120 “off”. If one lamp does not achieve 200 switchings, a further 3 lamps shall be tested, each of which shall achieve 200 switchings.*

The 200 switchings shall occur from normal mode with lamp-OFF, and to emergency mode with lamp-ON.

After this test, the ballast/control unit shall start and operate the three lamps, pre-conditioned by 200 switchings, at the rated operating voltage.

Additionally, the same three lamps shall start and operate from the appropriate mains operation reference ballast/circuit.

## 16 Lamp current

The requirements in this clause only apply to fluorescent lamps. Requirements for other light sources are under consideration.

The controlgear shall limit the arc current delivered to a reference lamp to a value not exceeding 125 % of that delivered to the same lamp when operated with a reference controlgear. Measurements shall be made in 25 °C ambient temperature, the test controlgear shall be operated at its rated operating voltage, and the appropriate reference controlgear shall be operated at its rated voltage and frequency.

Reference lamps and ballasts shall be in compliance with IEC 60081, IEC 60901, IEC 60921 and IEC 60929.

## 17 Supply current

At the d.c. rated operating voltage, the supply current from the battery shall not differ by more than  $\pm 15$  % from the declared value when the ballast is operated with a reference lamp.

The supply shall be of low impedance and low inductance (applicable only to batteries remote from the ballast).

[IEC 61347-2-7:2011](#)

<https://standards.iteh.ai/catalog/standards/sist/02c3728b-6930-41e9-a5c3-7e01521cee2/iec-61347-2-7-2011>

*Compliance is checked by measurement.*

## 18 Maximum current in any lead (with cathode preheating)

The requirements in this clause only apply to fluorescent lamps. Requirements for other light sources are under consideration.

The current flowing in any one of the cathode terminations shall not exceed the value given in the relevant lamp data sheets of IEC 60081 and IEC 60901.

*Compliance is checked by the relevant tests and measurements described in Clause 11 of IEC 60929.*

## 19 Lamp operating current waveforms

The requirements in this clause only apply to fluorescent lamps. Requirements for other light sources are under consideration.

Ballasts shall provide the correct waveform.

The waveform of the current supplied in the steady state to a reference lamp, associated with a ballast supplied at its rated operating voltage, shall be such that the peak current does not exceed 1,7 times the rated lamp current as specified on the relevant lamp data sheet of IEC 60081 and IEC 60901.

Additionally, the peak current shall not exceed 3 times the measured r.m.s. lamp current.