IEC 61347-2-7

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

AMENDMENT 2
AMENDEMENT 2

Lamp controlgear –
Part 2-7: Particular requirements for electric source for safety services (ESSS) supplied electronic controlgear for emergency lighting (self-contained)

Appareillages de lampes –
Partie 2-7: Exigences particulières relatives aux appareillages électroniques alimentés par source électrique de sécurité (ESSS) pour l'éclairage de secours (autonome)

IEC 61347-2-7:2011-12/AMD2:2021-12(en-fr)

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

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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LAMP CONTROLGEAR –

Part 2-7: Particular requirements for electric source for safety services (ESSS) supplied electronic controlgear for emergency lighting (self-contained)

AMENDMENT 2

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Amendment 2 to IEC 61347-2-7:2011 has been prepared by subcommittee 34C: Auxiliaries for lamps, of IEC technical committee 34: Lighting.

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

Draft	Report on voting
34C/1536/FDIS	34C/1540/RVD

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 Amendment 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/standardsdev/publications/.

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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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Title of Part 2-7

In the existing title, replace "battery" with "electric source for safety services (ESSS)" as follows:

Part 2-7: Particular requirements for electric source for safety services (ESSS) supplied electronic controlgear for emergency lighting (self-contained)

Introduction to Amendment 2

The following significant technical changes have been introduced in this Amendment 2:

a) clarification of rest mode and inhibiting mode requirements;
b) introduction of requirements for controlgear using lithium batteries;
c) introduction of requirements for controlgear using electric double-layer capacitors (EDLCs);
d) introduction of the term "electric source for safety services (ESSS)" to cover both batteries and EDLCs;
e) clarification of changeover operation requirements.

1 Scope

Replace the text of the Scope, modified by Amendment 1, with the following new text:

This part of IEC 61347 specifies particular safety requirements for electric source for safety services (ESSS) 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 in IEC 60598-2-22.

It is intended for controlgear for fluorescent lamps and other lamp types for example incandescent lamps, high pressure discharge lamps and LEDs.

This document 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 the IEC 61347 series.

DC supplied electronic controlgear for emergency lighting can (or not) include the electric source for safety services (ESSS).

This document does not apply to d.c. supplied electronic controlgear for emergency lighting, which are intended for connection to a centralized emergency power supply system. A centralized emergency power system could be a central battery system.

NOTE Annex J of IEC 61347-2-3:2011/AMD1:2016 applies to a.c., a.c./d.c. or d.c. supplied electronic controlgear for connection to centralized emergency power supply systems that are also intended for emergency lighting operations from a.c./d.c. supplies.

2 Normative references

Replace the existing references to IEC 60598-2-22 and IEC 61347-1 with the following new references:

IEC 60598-2-22:2021, *Luminaires – Part 2-22: Particular requirements – Luminaires for emergency lighting*

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

3 Terms and definitions

3.3

Replace the existing definition of "recharging device" with the following new definition:

recharging device
device to maintain the charge of and recharge an electric source for safety services (ESSS)

3.4

Replace the existing definition of "protection device against extensive discharge", modified by Amendment 1, with the following new definition:

protection device against extensive discharge
automatic device to disconnect the controlgear from the electric source for safety services (ESSS) when the ESSS voltage drops below a certain value

3.11

Replace the existing definition of "remote control" with the following new definition:

remote control
device to prevent discharge of the electric source for safety services (ESSS) by the lamp operating circuit when normal illumination has been switched off centrally

3.12

Replace the existing definition of "indicator" with the following new definition:

indicator
device that indicates the luminaire is connected, the electric source for safety services (ESSS) is being charged, and circuit continuity exists through the tungsten filament of emergency lighting lamps where appropriate

3.14

Replace the existing definition of "control unit" with the following new definition:

control unit
unit or set of units comprising a supply changeover system, an electric source for safety services (ESSS) charging device and a means for testing as appropriate

Add, at the end of 3.18, added by Amendment 1, the following new entries 3.19, 3.20 and 3.21:

3.19
rated duration of emergency operation
time, as claimed by the manufacturer, during which the rated emergency lumen output is provided

3.20
rest mode
state of a controlgear in a self-contained emergency luminaire where the output is intentionally shut down while the normal supply is off and that, in the event of restoration of the normal supply, automatically reverts to normal mode

[SOURCE: IEC 60598-2-22:2021, 22.3.18, modified – The definition has been revised to assign this function to the controlgear.]

3.21
remote inhibiting mode
state of a controlgear in a self-contained emergency luminaire which is inhibited from operating by a remote device while the normal supply is on and in the case of a normal supply failure when the controlgear in the luminaire does not change over to emergency mode

[SOURCE: IEC 60598-2-22:2021, 22.3.21, modified – The definition has been revised to assign this function to the controlgear.]

5 General notes on tests

In the fourth dashed item and in the penultimate paragraph replace "batteries" and "battery" with "ESSSs" and "ESSS".

7 Marking

7.2 Information to be provided

In the 10th, 11th, 12th and 13th (modified by Amendment 1) dashed items, replace "battery" with "ESSS".

Replace the 14th dashed item beginning with "information required for correct battery selection...", including NOTES 2 and 3, with the following new dashed item and notes:

– for controlgear designed to use rechargeable battery, information required for correct battery selection shall be provided.

  If the manufacturer indicates that batteries are only replaceable with a specific type, the battery technology (e.g. NiMH) together with the type reference or the code of the replaceable battery shall be provided. If the battery is replaceable with another type, the following details shall be provided:

  - technology of the battery (e.g. NiCd, NiMH);
  - type designation of the battery according to the relevant standard (e.g. temperature classification);

- 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;

Controlgear containing any non-replaceable battery shall be marked to indicate that the battery is non-replaceable.

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

NOTE 3 Reference to an ESSS type and manufacturer is also acceptable.

Insert, between the 14th dashed item and the 15th last dashed item, the following new dashed item:

– for controlgear designed to use an EDLC as an ESSS, information required for correct EDLC selection shall be provided.

If the manufacturer indicates that the EDLC is only replaceable with a specific type, the type reference or the code of the replaceable EDLC shall be provided. If the EDLC is replaceable with another type, the following details shall be provided:

- type of EDLC (according to the applicable IEC standard);
- rated voltage, and maximum charge voltage provided by the controlgear;
- capacity;
- temperature rating;
- temperature classification;
- dimensions.

Controlgear containing non-replaceable EDLC(s) shall be marked to indicate that the EDLC is non-replaceable.

NOTE 4 All electrical data are based on 25 °C reference conditions.

NOTE 5 Reference to an ESSS type and manufacturer is also acceptable.

Add, at the end of the last dashed item beginning with "information regarding the installation...", the following new dashed items and note:

– the rated charge time, if lower than 24 h, can be declared;
– the manufacturer shall make available information of the allowed time for the controlgear to stay in rest mode or remote inhibiting mode after a full charging period, in order to provide at least 50 % of the rated duration of the emergency operation.

- time shall be declared in days;
- for controlgear provided without battery or without a clear indication about which battery to use, details for calculation shall be provided in accordance with 25.6.2.

NOTE 6 Examples of declared periods are 7, 30 or 90 days.

14 Fault conditions

Replace the title of Clause 14 "Fault conditions" with "Void" as follows :

14 Void

and delete the text "Not applicable.".

17 Supply current

In the first two paragraphs, modified by Amendment 1, replace "battery" with "ESSS" and "batteries" with "ESSSs".

20 Functional safety (EBLF, EOFx)

20.1 Requirements for fluorescent lamp controlgear

Replace the fourth paragraph beginning with "Electronic controlgear provided..." and the fifth paragraph, including the list items, with the following new text:

Electronic controlgear provided with or without ESSSs:

For measurement of EBLF, voltages representative of a fully charged ESSS and the ESSS voltage present just before lamp extinguishing are used as follows:

V_1 – Full charge battery voltage per cell dependent on battery type as follows:

NiCd (Nickel Cadmium)	*1,35 V per cell;*
NiMH (Nickel Metal-Hydride)	*1,35 V per cell;*
Pb (Lead acid)	*2,10 V per cell;*
Li(NiCoMn)O_2 (Lithium Nickel Manganese Cobalt Oxide)	*4,0 V;*
$LiFePO_4$ (Lithium Iron Phosphate)	*3,65 V;*
LTO (Lithium Titanate Oxide)	*2,80 V;*

(values given by default and can be different depending on the battery manufacturer's declaration of design);

EDLC – Full charge EDLC voltage measured after full charge;

V_{min} – End of capacity battery voltage per cell dependent on battery type as follows:

NiCd	*1,10 V;*
NiMH	*1,10 V;*
Pb	*1,80 V;*
Li(NiCoMn)O_2	*3,10 V;*
$LiFePO_4$	*2,00 V;*
LTO	*1,65 V;*

(values given by default and can be different depending on the battery manufacturer's declaration of design);

EDLC – The lowest value measured at the end of emergency operation immediately before the light source extinguishes.

20.2 Requirements for LED lamp controlgear

20.2.1 Constant current LED controlgear: EOF_I and $I_{emergency}$

Replace the existing Subclause 20.2.1, added by Amendment 1, with the following new text:

LED light sources show a direct relation between forward current and light output with only a slight deviation due to an improved efficacy when operated at lower temperatures.

The emergency output factor of the forward current, EOF_I, is the ratio of the average current measured in emergency mode ($I_{emergency}$) and the average forward current measured at rated conditions ($I_{normal\ mode}$).

Compliance is checked by the following test set-up:

For compliance measurements of EOF_I the controlgear shall be operated with a load producing the maximum and the minimum of the output voltage range (or power).

Electronic controlgear provided with or without ESSSs:

For the measurement of $I_{emergency}$ and EOF_I voltages representative of a fully charged battery and the battery voltage present just before the lamp extinguishes are used as follows:

V_1 – Full charge battery voltage per cell dependent on battery type as follows:

NiCd	*1,35 V per cell;*
NiMH	*1,35 V per cell;*
Pb	*2,10 V per cell;*
$Li(NiCoMn)O_2$	*4,0 V;*
$LiFePO_4$	*3,65 V*
LTO	*2,80 V;*

(values given by default and can be different depending on the battery manufacturer's declaration of design).

EDLC – Full charge EDLC voltage measured after full charge;

V_{min} – End of capacity battery voltage per cell dependent on battery type as follows:

NiCd	*1,10 V;*
NiMH	*1,10 V;*
Pb	*1,80 V;*
$Li(NiCoMn)O_2$	*3,1 V;*
$LiFePO_4$	*2,00 V;*
LTO	*1,65 V.*

(values given by default and can be different depending on the battery manufacturer's declaration of design).

EDLC – the lowest value measured at the end of emergency operation immediately before the light source extinguishes.

Where the controlgear cut off voltage is above these voltages, the cut off voltage becomes V_{min}.

Measurement of $I_{emergency}$ shall be made at an ambient temperature of 25 °C. The first measurement of the output current is made at V_1 at 5 s and at 60 s after the application of the d.c. voltage.

The second measurement of the output current is made at V_{min}.

The lower of the current measured at 60 s and V_1 or V_{min} shall be retained as $I_{emergency}$ and shall reach at least the declared value for $I_{emergency}$ and EOF_I when compared with the output current ($I_{normal\ mode}$) of the controlgear measured under normal conditions with the same load.

The value measured at 5 s and V_1 shall reach at least 50 % of the current $I_{emergency}$.

$$EOF_I = \frac{I_{\text{emergency}}}{I_{\text{normal mode}}}$$

For LED controlgear declared for use in luminaires for high-risk task area lighting the measurements at V_1 are carried out after 0,5 s.

21 Changeover operation

Insert, between the existing first and second paragraphs of Clause 21, modified by Amendment 1, the following new paragraphs:

In the case of a rated supply voltage range, then changeover from normal to emergency mode shall occur at not less than 0,6 times the maximum of the rated supply voltage range. It shall not occur at greater than 0,85 times the minimum of the rated supply voltage range.

Controlgear with a selectable input voltage should be tested for changeover operation at each voltage setting.

In NOTE 1, replace "batteries" with "ESSSs" and "may" with "can".

In the first sentence of the last existing paragraph, modified by Amendment 1, replace "rated supply voltage" with "minimum rated supply voltage".

Replace the existing NOTE 2 with the following new NOTE 2:

NOTE 2 In Japan, changeover from normal to emergency mode at not less than 0,4 times the rated supply voltage is accepted. In the case of universal controlgear without a selectable input voltage, changeover from normal to emergency mode at not less than 0,4 times the minimum of the supply voltage range is accepted.

22 Recharging device

Replace the existing Clause 22, modified by Amendment 1, with the following new Clause 22:

The recharging device, if provided, shall provide the rated charge performance as declared by the controlgear manufacturer to charge the ESSS within 24 h, or the recharging time declared by the manufacturer as in 7.2, over the rated ambient temperature range and when operating at voltages within the range of 0,9 times the rated operating voltage (range) and 1,06 times the rated operating voltage (range).

Transformers built into controlgear for self-contained emergency luminaires for charging the batteries shall comply with the relevant requirements of IEC 61558-2-1, IEC 61558-2-6 and IEC 61558-2-16, these requirements being specified for associated transformers as required in IEC 61558-1.

Compliance is checked by the tests of 22.1 to 22.5.

22.1 Low temperature operation – The ESSS shall be charged for 48 h or twice the charge time as declared in 7.2 with a minimum of 12 h and then discharged until the voltage indicated in Table 1 is achieved.