



INTERNATIONAL STANDARD



~~Lamp controlgear –~~
Controlgear for electric light sources – Safety –
~~Part 2-10: Particular requirements for electronic invertors~~
~~and convertors for high-frequency operation of cold start~~
~~tubular discharge lamps (neon tubes)~~ Particular requirements – Electronic
controlgear for high-frequency operation of tubular cold-cathode discharge
lamps (neon tubes)

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.140.99

ISBN 978-2-8322-8917-4

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	9
3 Terms and definitions	9
4 General requirements	11
5 General notes on tests	11
6 Classification.....	11
7 Marking	12
7.1 Marking and information.....	12
7.1.1 Items to be marked Mandatory marking	12
7.1.2 Durability and legibility of marking Information to be provided.....	12
7.2 Durability and legibility	13
7.3 Built-in controlgear.....	13
8 Terminals	13
9 Provisions for Earthing	13
10 Protection against accidental contact with live parts	13
11 Moisture resistance and insulation.....	14
12 Electric strength	14
13 Thermal endurance test for windings	14
14 Normal conditions.....	14
15 Abnormal conditions	15
16 Fault conditions	16
17 Construction	16
18 Creepage distances and clearances	16
19 Protective circuits	17
19.1 General.....	17
19.2 Earth-leakage protection	17
20 Screws, current-carrying parts and connections.....	19
21 Resistance to heat, fire and tracking.....	19
22 Resistance to corrosion	19
23 No-load rated output voltage and rated output current	19
24 Applicable annexes of IEC 61347-1	20
Annex A Annex I (normative) Measurement of current and voltages in the output circuits of electronic controlgear for neon tubes	23
A.1 General.....	23
A.1.1 Information to be provided by manufacturers	23
A.1.2 Measurement of output voltage and current	23
A.1.3 Amplitude modulations.....	24
A.1.4 Spikes and high-frequency harmonics.....	24
A.1.5 Test conditions	24
A.2 Instrumentation	24
A.3 Measurements	25
A.3.1 Measurement of no-load output voltage	25

- ↓A.3.2 Measurement of output current 26
- ↓A.3.3 Measurement of earth fault currents 26
- Annex B (informative) Schedule of more onerous requirements 27
- Bibliography 28

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

~~Part 2-10: Particular requirements for electronic invertors and convertors for high-frequency operation of cold start tubular discharge lamps (neon tubes)~~

Particular requirements – Electronic controlgear for high-frequency operation of tubular cold-cathode discharge lamps (neon tubes)

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 61347-2-10:2000+AMD1:2008 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 61347-2-10 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 2000 and Amendment 1:2008. 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 as appropriate;
- b) clarification of sample item numbers.

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

Draft	Report on voting
34C/1584/CDV	34C/1592/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.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

~~This part of IEC 61347, 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 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 61347-2-10:2000 and IEC 61347-2-10:2000/AMD1:2008 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 61347-2-10:2000 and IEC 61347-2-10:2000/AMD1:2008.

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.

In order to check the safety of controlgear, it is necessary to check their performance. However, since no standardization of the characteristics of neon tubes exists, reference loads are specified in this document to ensure reproducible test results.

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 2-10: ~~Particular requirements for electronic invertors and convertors for high-frequency operation of cold start tubular discharge lamps (neon tubes)~~

Particular requirements – Electronic controlgear for high-frequency operation of tubular cold-cathode discharge lamps (neon tubes)

1 Scope

This part of IEC 61347 specifies ~~particular~~ safety requirements for electronic ~~invertors and convertors~~ controlgear for high-frequency operation of tubular cold-cathode discharge lamps used in signs and luminous discharge tube installations and operating with an output voltage exceeding 1 000 V but not exceeding 10 000 V for direct connection to DC or AC supply voltages not exceeding 1 000 V (at 50 Hz or 60 Hz ~~or 1 000 V d.c~~ in case of alternating current).

NOTE 1 Historically, such types of controlgear were referred to as invertors or convertors.

NOTE 12 In Japan, the ~~output~~ voltage limit for the application of this document is set to 15 000 V ~~is acceptable~~.

~~The requirements for two types of invertors and convertors, types A and B, are specified as follows:~~

~~— Type A unit: an inverter or convertor operating within the frequency range 20 kHz to 50 kHz, and having an output voltage (between terminals) not exceeding 5 000 V peak, a maximum output current limited to 35 mA (r.m.s.) and 50 mA (peak value). The supply voltage does not exceed 250 V at 50 Hz or 60 Hz or 250 V d.c.~~

~~NOTE 2 The output current of a type A unit may be considered as not presenting an electric shock hazard due to the limits on the current and frequency range.~~

~~NOTE 3 In Japan, the output voltage of 15 000 V is acceptable.~~

~~— Type B unit: an inverter or convertor having a no-load output voltage not exceeding 5 000 V to earth or 10 000 V between terminals, operating within the frequency range 10 kHz to 100 kHz with a maximum output current limited to 200 mA (r.m.s.) and 400 mA (peak value).~~

~~NOTE 4 Type B units require additional protection in the output circuit.~~

~~NOTE 5 In Japan, a type B unit exceeding 50 mA and/or the secondary grounded is not acceptable.~~

~~In order to check the safety of invertors or convertors, it is necessary to check their performance. However, since no standardization of the characteristics of neon tubes exists, reference loads are specified in this standard to ensure reproducible test results.~~

~~The rated maximum operating temperature of the winding, t_w , is not applicable to this standard.~~

This document applies for controlgear of type A and controlgear of type B, which are specified as follows:

- Type A: controlgear operating within the frequency range 20 kHz to 50 kHz, and having an output voltage not exceeding 5 000 V peak between terminals, with a maximum output current limited to 35 mA (RMS) and 50 mA (peak value) and a supply voltage not exceeding 250 V.

NOTE 3 The output current of a type A unit can be considered as not presenting an electric shock hazard due to the limits on the current and frequency range.

NOTE 4 In Japan, the output voltage of 15 000 V is acceptable.

- Type B: controlgear operating within the frequency range 10 kHz to 100 kHz and having a no-load output voltage not exceeding 10 000 V between terminals or not exceeding 5 000 V to earth, with a maximum output current limited to 200 mA (RMS) and 400 mA (peak value).

NOTE 5 In Japan, a type B controlgear providing an output current exceeding 50 mA is not acceptable.

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:~~

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

IEC 60598-1:2020, *Luminaires – Part 1: General requirements and tests*

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

~~ISO 3864:1984, *Safety colours and safety signs*~~

ISO 3864-1:2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Controlgear for electric light sources – Safety –
Part 2-10: Particular requirements – Electronic controlgear for high-frequency
operation of tubular cold-cathode discharge lamps (neon tubes)**

**Appareillages de commande pour les sources de lumière électriques – Sécurité –
Partie 2-10: Exigences particulières – Appareillages électroniques destinés à
l'alimentation en haute fréquence des lampes à décharge tubulaires à cathode
froide (tubes néon)**

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	8
4 General requirements	9
5 General notes on tests	9
6 Classification.....	10
7 Marking	10
7.1 Marking and information.....	10
7.1.1 Mandatory marking	10
7.1.2 Information to be provided	10
7.2 Durability and legibility	11
7.3 Built-in controlgear.....	11
8 Terminals	11
9 Earthing.....	11
10 Protection against accidental contact with live parts	11
11 Moisture resistance and insulation.....	12
12 Electric strength	12
13 Thermal endurance test for windings	12
14 Normal conditions.....	12
15 Abnormal conditions	13
16 Fault conditions	13
17 Construction.....	14
18 Creepage distances and clearances	14
19 Protective circuits	14
19.1 General.....	14
19.2 Earth-leakage protection	15
19.3 Open-circuit protection.....	15
20 Screws, current-carrying parts and connections.....	16
21 Resistance to heat, fire and tracking.....	16
22 Resistance to corrosion	16
23 No-load rated output voltage and rated output current	16
24 Applicable annexes of IEC 61347-1	16
Annex A (normative) Measurement of current and voltages in the output circuits of electronic controlgear for neon tubes	17
A.1 General.....	17
A.1.1 Information to be provided by manufacturers	17
A.1.2 Measurement of output voltage and current	17
A.1.3 Amplitude modulations.....	17
A.1.4 Spikes and high-frequency harmonics.....	18
A.1.5 Test conditions	18
A.2 Instrumentation	18
A.3 Measurements	19

- A.3.1 Measurement of no-load output voltage 19
- A.3.2 Measurement of output current 19
- A.3.3 Measurement of earth fault currents 20
- Annex B (informative) Schedule of more onerous requirements 21
- Bibliography..... 22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –**Part 2-10: Particular requirements –
Electronic controlgear for high-frequency operation of tubular
cold-cathode discharge lamps (neon tubes)**

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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 61347-2-10 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 2000 and Amendment 1:2008. 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 as appropriate;
- b) clarification of sample item numbers.

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

Draft	Report on voting
34C/1584/CDV	34C/1592/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.

INTRODUCTION

The technical requirements in this document compared to IEC 61347-2-10:2000 and IEC 61347-2-10:2000/AMD1:2008 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 61347-2-10:2000 and IEC 61347-2-10:2000/AMD1:2008.

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.

In order to check the safety of controlgear, it is necessary to check their performance. However, since no standardization of the characteristics of neon tubes exists, reference loads are specified in this document to ensure reproducible test results.

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

CONTROLGEAR FOR ELECTRIC LIGHT SOURCES – SAFETY –

Part 2-10: Particular requirements – Electronic controlgear for high-frequency operation of tubular cold-cathode discharge lamps (neon tubes)

1 Scope

This part of IEC 61347 specifies safety requirements for electronic controlgear for high-frequency operation of tubular cold-cathode discharge lamps used in signs and luminous discharge tube installations and operating with an output voltage exceeding 1 000 V but not exceeding 10 000 V for direct connection to DC or AC supply voltages not exceeding 1 000 V (at 50 Hz or 60 Hz in case of alternating current).

NOTE 1 Historically, such types of controlgear were referred to as invertors or convertors.

NOTE 2 In Japan, the voltage limit for the application of this document is set to 15 000 V.

This document applies for controlgear of type A and controlgear of type B, which are specified as follows:

- Type A: controlgear operating within the frequency range 20 kHz to 50 kHz, and having an output voltage not exceeding 5 000 V peak between terminals, with a maximum output current limited to 35 mA (RMS) and 50 mA (peak value) and a supply voltage not exceeding 250 V.

NOTE 3 The output current of a type A unit can be considered as not presenting an electric shock hazard due to the limits on the current and frequency range.

NOTE 4 In Japan, the output voltage of 15 000 V is acceptable.

- Type B: controlgear operating within the frequency range 10 kHz to 100 kHz and having a no-load output voltage not exceeding 10 000 V between terminals or not exceeding 5 000 V to earth, with a maximum output current limited to 200 mA (RMS) and 400 mA (peak value).

NOTE 5 In Japan, a type B controlgear providing an output current exceeding 50 mA is not acceptable.

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

IEC 60598-1:2020, *Luminaires – Part 1: General requirements and tests*

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

ISO 3864-1:2011, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs and safety markings*

SOMMAIRE

AVANT-PROPOS.....	26
INTRODUCTION.....	28
1 Domaine d'application	29
2 Références normatives	29
3 Termes et définitions	30
4 Exigences générales	31
5 Généralités sur les essais.....	32
6 Classification	32
7 Marquage	32
7.1 Marquages et informations	32
7.1.1 Marquages obligatoires	32
7.1.2 Informations à fournir.....	33
7.2 Durabilité et lisibilité.....	33
7.3 Appareillage à incorporer	33
8 Bornes.....	34
9 Mise à la terre	34
10 Protection contre le contact accidentel avec des parties actives	34
11 Résistance à l'humidité et isolement.....	34
12 Rigidité diélectrique	35
13 Essai d'endurance thermique des enroulements	35
14 Conditions normales	35
15 Conditions anormales	35
16 Conditions de défaut.....	36
17 Construction	36
18 Lignes de fuite et écartements.....	37
19 Circuits de protection.....	37
19.1 Généralités	37
19.2 Protection contre les défauts de fuite à la terre	37
19.3 Protection contre les défauts de circuit ouvert.....	38
20 Vis, parties transportant le courant et connexions.....	39
21 Résistance à la chaleur, au feu et aux courants de cheminement	39
22 Résistance à la corrosion	39
23 Tension de sortie assignée à vide et courant de sortie assigné.....	39
24 Annexes applicables de l'IEC 61347-1	40
Annexe A (normative) Mesurage des courants et tensions dans les circuits de sortie des appareillages électroniques pour tubes néon.....	41
A.1 Généralités	41
A.1.1 Informations à fournir par les fabricants.....	41
A.1.2 Mesurage de la tension et du courant de sortie.....	41
A.1.3 Modulations d'amplitude	42
A.1.4 Impulsions brèves et harmoniques à haute fréquence.....	42
A.1.5 Conditions d'essai	42
A.2 Instrumentation	42
A.3 Mesurages	43

- A.3.1 Mesurage de la tension de sortie à vide.....43
- A.3.2 Mesurage du courant de sortie44
- A.3.3 Mesurage des courants de défaut à la terre44
- Annexe B (informative) Planification des exigences les plus importantes45
- Bibliographie.....46

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

APPAREILLAGES DE COMMANDE POUR LES SOURCES DE LUMIÈRE ÉLECTRIQUES – SÉCURITÉ –

Partie 2-10: Exigences particulières – Appareillages électroniques destinés à l'alimentation en haute fréquence des lampes à décharge tubulaires à cathode froide (tubes néon)

AVANT-PROPOS

- 1) La Commission Electrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
- 2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
- 3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
- 4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
- 5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
- 6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
- 7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'a pas reçu notification qu'un ou plusieurs brevets pouvaient être nécessaires à sa mise en application. Toutefois, il y a lieu d'avertir les responsables de la mise en application du présent document que des informations plus récentes sont susceptibles de figurer dans la base de données de brevets, disponible à l'adresse <https://patents.iec.ch>. L'IEC ne saurait être tenue pour responsable de ne pas avoir identifié tout ou partie de tels droits de propriété.

L'IEC 61347-2-10 a été établie par le sous-comité 34C: Appareils auxiliaires pour lampes, du comité d'études 34 de l'IEC: Éclairage. Il s'agit d'une Norme internationale.

Cette seconde édition annule et remplace la première édition parue en 2000 et l'Amendement 1:2008. Cette édition constitue une révision technique.

Cette édition inclut les modifications techniques majeures suivantes par rapport à l'édition précédente:

- a) ajout de références datées le cas échéant;
- b) clarification des numéros d'entités d'échantillonnage.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
34C/1584/CDV	34C/1592/RVC

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/publications/.

Le présent document est destiné à être utilisé conjointement avec l'IEC 61347-1:2015 et l'IEC 61347-1:2015/AMD1:2017. Lorsque les exigences de l'un des articles de l'IEC 61347-1:2015 et de l'IEC 61347-1:2015/AMD1:2017 sont citées en référence dans le présent document par la phrase "L'IEC 61347-1:2015, Article n et l'IEC 61347-1:2015/AMD1:2017, Article n s'appliquent", cette phrase signifie que l'ensemble des exigences de cet article de l'IEC 61347-1:2015 et de l'IEC 61347-1:2015/AMD1:2017 s'appliquent, excepté les exigences qui ne s'appliquent explicitement pas au type particulier d'appareillage couvert par le présent document.

NOTE Dans le présent document, les caractères d'imprimerie suivants sont utilisés:

- *déclarations de conformité: caractères italiques.*

Une liste de toutes les parties de la série IEC 61347, publiées sous le titre général *Appareillages de commande pour les sources de lumière électriques – Sécurité*, se trouve sur le site web de l'IEC.

Les futurs documents de cette série porteront le nouveau titre général cité ci-dessus. Le titre des documents qui existent déjà dans cette série sera mis à jour lors de leur prochaine édition.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

INTRODUCTION

Les exigences techniques spécifiées dans le présent document par rapport à l'IEC 61347-2-10:2000 et à l'IEC 61347-2-10:2000/AMD1:2008 n'ont pratiquement pas évolué. Néanmoins, l'élaboration d'une nouvelle édition du présent document était inévitable, car sans l'ajout de références datées à l'IEC 61347-1:2015 et l'IEC 61347-1:2015/AMD1:2017, l'applicabilité de la quatrième édition de l'IEC 61347-1:—¹ aurait été implicite en raison des références à l'IEC 61347-1 non datées dans l'IEC 61347-2-10:2000 et l'IEC 61347-2-10:2000/AMD1:2008.

Lorsque le présent document fait référence à l'un des articles de l'IEC 61347-1:2015 et l'IEC 61347-1:2015/AMD1:2017, celui-ci spécifie le degré d'applicabilité de cet article. Des exigences supplémentaires sont également fournies, lorsque cela est nécessaire.

Dans le but de vérifier la sécurité des appareillages, il est nécessaire de vérifier leurs performances. Cependant, comme il n'existe aucune normalisation pour les caractéristiques des tubes néon, des charges de référence sont spécifiées dans le présent document afin d'obtenir des résultats d'essai reproductibles.

¹ Quatrième édition en cours d'élaboration. Stade à la date de publication IEC FDIS 61347-1:2024.

APPAREILLAGES DE COMMANDE POUR LES SOURCES DE LUMIÈRE ÉLECTRIQUES – SÉCURITÉ –

Partie 2-10: Exigences particulières – Appareillages électroniques destinés à l'alimentation en haute fréquence des lampes à décharge tubulaires à cathode froide (tubes néon)

1 Domaine d'application

La présente partie de l'IEC 61347 spécifie les exigences de sécurité des appareillages électroniques destinés à l'alimentation en haute fréquence des lampes à décharge tubulaires à cathode froide utilisées dans les enseignes et les installations à tubes à décharge lumineux et qui fonctionnent à une tension de sortie supérieure à 1 000 V, mais ne dépassant pas 10 000 V, pour la connexion directe à des tensions d'alimentation inférieures ou égales à 1 000 V en courant continu ou courant alternatif (à 50 Hz ou 60 Hz en courant alternatif).

NOTE 1 Par le passé, ce type d'appareillage était désigné par le terme "onduleur" ou "convertisseur".

NOTE 2 Au Japon, la limite de courant pour l'application du présent document est de 15 000 V.

Le présent document s'applique aux appareillages de types A et B, qui sont spécifiés comme suit:

- Type A: appareillages fonctionnant dans la plage de fréquences de 20 kHz à 50 kHz et dont la tension de sortie est inférieure ou égale à 5 000 V (valeur de crête) entre les bornes, avec un courant de sortie maximal limité à 35 mA (valeur efficace) et à 50 mA (valeur de crête) et une tension d'alimentation inférieure ou égale à 250 V.

NOTE 3 Le courant de sortie d'une unité de type A peut être considéré comme ne présentant pas de danger de choc électrique en raison des limites appliquées sur le courant et la plage de fréquences.

NOTE 4 Au Japon, une tension de sortie de 15 000 V est acceptable.

- Type B: appareillages fonctionnant dans la plage de fréquences de 10 kHz à 100 kHz et dont la tension de sortie à vide est inférieure ou égale à 10 000 V entre les bornes ou inférieure ou égale à 5 000 V entre les bornes et la terre, avec un courant de sortie maximal limité à 200 mA (valeur efficace) et à 400 mA (valeur de crête).

NOTE 5 Au Japon, les appareillages de type B qui fournissent un courant de sortie supérieur à 50 mA ne sont pas acceptables.

2 Références normatives

Les documents suivants sont cités dans le texte de sorte qu'ils constituent, pour tout ou partie de leur contenu, des exigences du présent document. Pour les références datées, seule l'édition citée s'applique. Pour les références non datées, la dernière édition du document de référence s'applique (y compris les éventuels amendements).

IEC 60417, *Symboles graphiques utilisables sur le matériel*, disponible à l'adresse <https://www.graphical-symbols.info/equipment>

IEC 60598-1:2020, *Luminaires – Partie 1: Exigences générales et essais*

IEC 61347-1:2015, *Appareillages de lampes – Partie 1: Exigences générales et exigences de sécurité*

IEC 61347-1:2015/AMD1:2017

ISO 3864-1:2011, *Symboles graphiques – Couleurs de sécurité et signaux de sécurité – Partie 1: Principes de conception pour les signaux de sécurité et les marquages de sécurité*