IEC 60598-2-23

Edition 2.0 2020-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Luminaires –
Part 2-23: Particular requirements – Extra-low-voltage lighting systems for ELV light sources

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Partie 2-23: Exigences particulières – Systèmes d'éclairage à très basse tension pour sources de lumière TBT:

IEC 60598-2-23:2020-07(en-fr)

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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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

LUMINAIRES –

Part 2-23: Particular requirements – Extra-low-voltage lighting systems for ELV light sources

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International Standard IEC 60598-2-23 has been prepared by subcommittee 34D: Luminaires, of IEC technical committee 34: Lamps and related equipment.

This second edition cancels and replaces the first edition published in 1996 and Amendment 1:2000. This edition constitutes a technical revision.

This edition includes the following technical changes with respect to the previous edition (there are no major technical changes, see Annex A):

a) The title has been modified to allow the inclusion of other light sources;
b) The scope has been updated to be aligned with the other parts of the IEC 60598-2 series and to include other light sources;
c) Normative references and the reference to transformer and controlgear standards have been updated;
d) The short circuit test (23.7.6.1 and 23.7.6.2) was removed and reference is now made to the same test in Part 1.

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

FDIS	Report on voting
34D/1543/FDIS	34D/1557/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

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

This Part 2-23 is to be used in conjunction with the latest edition of IEC 60598-1 and its amendment(s). It was established on the basis of the ninth edition (20XX) of that standard (under preparation).

NOTE 1 When "Part 1" is mentioned in this document, it refers to IEC 60598-1.

A list of all parts in the IEC 60598 series, published under the general title *Luminaires* can be found on the IEC website.

NOTE 2 In this document, the following print type is used:

- *compliance statements: in italic type*

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- reconfirmed,
- withdrawn,
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LUMINAIRES –

Part 2-23: Particular requirements – Extra-low-voltage lighting systems for ELV light sources

23.1 Scope

This part of IEC 60598 specifies requirements for extra-low-voltage lighting systems for ELV light sources, intended for ordinary interior use on supply voltages not exceeding 1 000 V. The luminaires, being connected in parallel, are supplied via freely suspended continuous supporting conductors or profiles, the current in the ELV part of the system not exceeding 25 A.

23.2 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.

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IEC TR 60083, *Plugs and socket-outlets for domestic and similar general use standardized in member countries of IEC*

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

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IEC 61347-2-2, *Lamp controlgear – Part 2-2: Particular requirements for d.c. or a.c. supplied electronic step-down convertors for filament lamps*

IEC 61347-2-13, *Lamp controlgear – Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules*

IEC 61558-2-6, *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, *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*

23.3 Terms and definitions

For the purposes of this document, the terms and definitions given in Part 1 and the following apply (see Figure 1).

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

23.3.1
extra-low-voltage lighting system
lighting system in kit form for light sources consisting of a transformer/convertor or controlgear, supporting conductors and luminaires, as well as all the necessary fixing devices and the electrical/mechanical connectors

23.3.2
supporting conductor
conductive span wire or profile freely spanned or mounted between the main points of support, serving to supply the luminaires, and carrying the mass of the luminaires of the extra-low-voltage lighting system

23.3.3
main support
device ensuring a sufficient mechanical connection of the supporting conductor(s) with the appropriate parts of the building in which the extra-low-voltage lighting system is to be used

Note 1 to entry: Auxiliary supports may be necessary between the main supports.

23.3.4
auxiliary support
device along the supporting conductor to hold it in its intended position

23.3.5
spacer
device maintaining the supporting conductors at the intended separation distance

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23.3.6
connector for supporting conductor
component for connecting electrically the supporting conductor(s) to the transformer/convertor or controlgear

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23.3.7
luminaire connector
component for connecting electrically and mechanically the luminaire to the supporting conductor

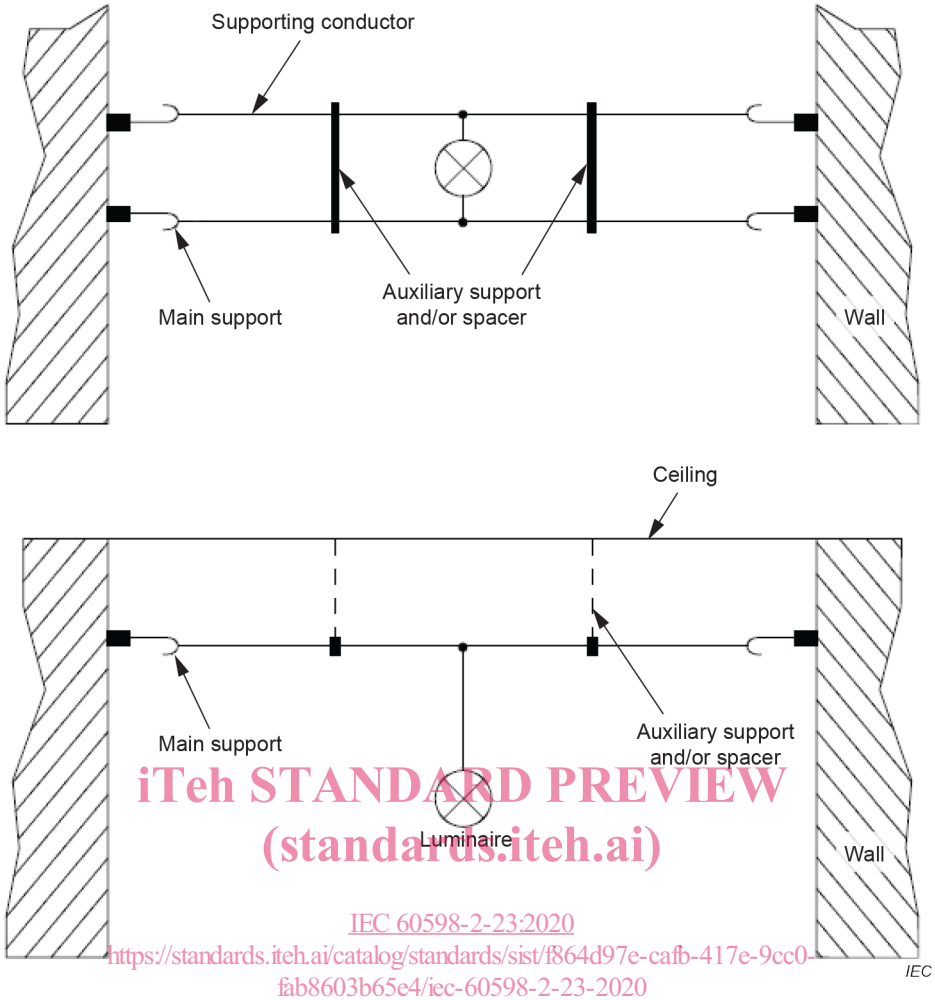

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Figure 1 – Typical supporting methods for lighting systems

23.4 General test requirements

The provisions of Section 0 of Part 1 apply. The tests described in each appropriate section of Part 1 shall be carried out in the order listed in this document.

Type tests shall be carried out on the complete extra-low-voltage lighting system as provided by the manufacturer.

23.5 Classification

Extra-low-voltage lighting systems shall be classified in accordance with the provisions of Section 2 of Part 1, together with the following requirement.

Luminaires in extra-low-voltage lighting systems shall be class III.

23.6 Marking

The provisions of Section 3 of Part 1 apply, together with the following requirements.

The extra-low-voltage lighting system shall be accompanied by installation instructions, including a complete list of all parts belonging to the system. The number and type of each part shall be clearly shown.

The installation instructions shall clearly and unambiguously state:

a) how the extra-low-voltage lighting system is to be mounted, and in particular, the maximum permitted distance between the main supports and the spacing of auxiliary supports;

b) whether special requirements, for example due to characteristics of the transformer/convertor/controlgear, shall be observed for components of an existing mains supply to which the extra-low-voltage lighting system is to be connected, for example socket-outlets, switches, dimmers;

c) that the supporting conductors of different extra-low-voltage lighting systems shall be mounted so as not to be able to come into contact with each other, where applicable;

d) that the extra-low-voltage lighting system shall not be extended beyond the number of luminaires belonging to the complete set, and that only parts assigned by the manufacturer shall be used;

e) that no additional attachments, for example for decorative purposes, shall be used;

f) that the following warning statement be provided:

WARNING – To avoid the risk of overheating and fire, do not bridge the conductors;

g) the positions or spacings for the connections of luminaires (if applicable).

23.7 Construction

The provisions of Section 4 of Part 1 apply, together with the requirements of 23.7.1 to 23.7.11.

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23.7.1 The whole set of the extra-low-voltage lighting system, as delivered by the manufacturer, shall be complete, including the transformer or convertor/controlgear. The secondary side of the extra-low-voltage lighting system shall comply with the requirements of SELV.

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Compliance is checked by mounting as in normal use, inspection and by the applicable measurements and tests required by this document.

23.7.2 Transformers, power supply units or switch mode power supply units provided with safety extra-low-voltage lighting systems shall be of the safety isolating type, complying with the requirements of IEC 61558-2-6 or IEC 61558-2-16, and having a rated output voltage not exceeding 25 V RMS or 60 V ripple free DC.

23.7.3 Convertors/controlgear provided with safety extra-low-voltage lighting systems shall be of the safety isolating type, complying with IEC 61347-2-2 or IEC 61347-2-13, and having a rated output voltage not exceeding 25 V RMS or 60 V ripple free DC.

23.7.4 Supporting conductors shall be continuous and shall be capable of supporting five times the mass of the luminaires (including their lamps) intended to be connected to them.

Compliance is checked by applying a load at 90° to the conductors to the mid-point of a maximum span equal to five times the weight of the luminaires and lamps supplied with the system, with a minimum load of 10 kg, for a period of 1 h, applied simultaneously to both conductors. After the test, the load is removed and the deflection from the normal position shall not exceed 10 % of the distance between the supporting conductors measured before applying the load.

If pin contacts or edge contacts are used in the system, then the supporting conductors shall have been subjected to 25 piercings at different places before the test.

23.7.5 Luminaire connectors shall be capable of supporting five times the mass of the luminaire (including its light source) without permanent deformation.

Compliance is checked by the test of 4.14.1 of Part 1 with a minimum load of 1,5 kg. The test shall be carried out after the test of 23.10.1, if applicable.

23.7.6 Short-circuit protection*:* Adequate means shall be provided to prevent impairing of safety due to unintended short-circuiting of uninsulated accessible SELV conductors of opposite polarity.

Compliance is checked by the test of 4.26.2 of Part 1.

23.7.7 Lampholders shall comply with the relevant IEC specifications.

Compliance is checked by inspection.

23.7.8 Instructions for use provided by the lamp manufacturers shall be observed.

Compliance is checked by inspection.

23.7.9 Electrical connections to supporting conductors shall not be subject to mechanical tension.

Compliance is checked by inspection.

23.7.10 Provisions shall be made for the extra-low-voltage lighting system to be insulated from the supporting structure.

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23.7.11 The rated current of the system shall be limited to 25 A.

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Compliance is checked by inspection and by rated data.

23.8 Creepage distances and clearances

The provisions of Section 11 of Part 1 apply.

23.9 Provisions for earthing

The provisions of Section 7 of Part 1 apply.

23.10 Terminals and electrical connections

The provisions of Sections 14 and 15 of Part 1, including the electrical tests, apply, together with the requirements of 23.10.1 to 23.10.3.

23.10.1 Connectors for luminaires may be connected to the supporting conductor by means of pin contacts or edge contacts which penetrate the insulation, if any, of the supporting conductor, and provide the electric contact with the conductor.

Compliance is checked by the test of 23.7.5 after that of 23.7.4.

23.10.2 If the supporting conductor is intended to be connected to the transformer/convertor/controlgear with a plug, the plug shall not be interchangeable with plugs and socket-outlets in accordance with IEC TR 60083.

Compliance is checked by inspection.

23.10.3 Good contact shall be maintained between all moveable electrical contact points in the system.

Compliance is checked by placing the luminaire or movable contact (with all parts giving a mechanical and electrical load to the contact connected) in five separate positions, observing the manufacturer's instructions. A current of 1,5 times the rated current shall be passed through each individual connection and, after 1 min, the voltage drop in each position shall not exceed 50 mV.

23.11 External and internal wiring

The provisions of Section 5 of Part 1 apply, together with the following requirement.

Supporting conductors shall be made of a suitable current-carrying material.

Compliance is checked by the test of 23.13.1.

23.12 Protection against electric shock

The provisions of Section 8 of Part 1 apply, together with the following requirement.

The supply voltage of the supporting conductors shall not exceed, for alternating current, 25 V RMS and for direct current, 60 V ripple-free.

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23.13 Endurance tests and thermal tests

The provisions of Section 12 of Part 1 apply, together with the requirements of 23.13.1 and 23.13.2.

23.13.1 The extra-low-voltage lighting system shall be tested in normal operation at 1,06 times its nominal supply voltage, or at 1,06 times the mean value of its nominal supply voltage range, with the exception of transformers/convertors or controlgear marked t_w/t_c, which shall be tested at their nominal voltage or at the mean value of the nominal supply voltage range.

Maximum surface temperatures of bare conductors in the output circuit shall not exceed 70 °C. In the case of insulated conductors, the upper limit is the maximum temperature permitted for the insulation used.

NOTE For details of t_w marking, refer to IEC 61347-2-8 or IEC 61558-2-6 as appropriate. For details of t_c marking, refer to IEC 61347-2-2 or IEC 61347-2-13 as appropriate.

23.13.2 During the test for abnormal operation, the extra-low-voltage lighting system shall be operated at a voltage between 0,9 and 1,1 times its nominal supply voltage or nominal supply voltage range, whichever gives the highest temperature values at the parts mentioned in Tables 12.3 to 12.5 of Part 1.

Points in the secondary circuit where short circuits can occur shall be short-circuited. In this connection, the lamps shall be completely inserted into the lampholders.

The maximum surface temperature of the conductors in the output circuit shall not exceed the temperatures found under normal operating conditions by more than 10 K.