

# INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –  
Part 2-59: Particular requirements for insect killers**

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Edition 4.0 2021-12  
COMMENTED VERSION

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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-59: Particular requirements for insect killers

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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**This commented version (CMV) of the official standard IEC 60335-2-59:2021 edition 4.0 allows the user to identify the changes made to the previous IEC 60335-2-59:2002 +AMD1:2006+AMD2:2009 CSV edition 3.2. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes.**

**A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text. Experts' comments are identified by a blue-background number. Mouse over a number to display a pop-up note with the comment.**

**This publication contains the CMV and the official standard. The full list of comments is available at the end of the CMV.**

IEC 60335-2-59 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2002, Amendment 1:2006 and Amendment 2:2009. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the text has been aligned with IEC 60335-1:2020;
- b) some notes have been converted to normative text or deleted (Clause 1, 11.8, 16.101, 23.5);
- c) temperature rise limits for accessible surface have been added (Clause 11).

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

| Draft        | Report on voting |
|--------------|------------------|
| 61/6378/FDIS | 61/6428/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 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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

A list of all parts in the IEC 60335 series, published under the general title *Household and similar electrical appliances – Safety*, can be found on the IEC website.

This Part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) of that standard.

NOTE 1 When “Part 1” is mentioned in this standard, it refers to IEC 60335-1.

This Part 2 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for insect killers.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies as far as is reasonable. When this standard states “addition”, “modification” or “replacement”, the relevant text in Part 1 is to be adapted accordingly.

NOTE 2 The following numbering system is used:

- subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

NOTE 3 The following print types are used:

- requirements: in roman type;
- *test specifications: in italic type;*
- notes: in small roman type.

Words in **bold** in the text are defined in Clause 3. When a definition concerns an adjective, the adjective and the associated noun are also in bold.

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](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

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

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The following differences exist in the countries indicated below.

- 6.1: Class 0 appliances for indoor use having a rated voltage not exceeding 150 V and class 0I appliances are allowed (Japan).
- Clause 22: The high voltage has to be obtained from an isolating transformer (Japan).
- Clause 22: Earthing of the secondary circuit of the transformer is not allowed (Japan).

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## INTRODUCTION

It has been assumed in the drafting of this International Standard that the execution of its provisions is entrusted to appropriately qualified and experienced persons.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

This standard recognizes the internationally accepted level of protection against hazards such as electrical, mechanical, thermal, fire and radiation of appliances when operated as in normal use taking into account the manufacturer's instructions. It also covers abnormal situations that can be expected in practice and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

This standard takes into account the requirements of IEC 60364 as far as possible so that there is compatibility with the wiring rules when the appliance is connected to the supply mains. However, national wiring rules may differ.

If an appliance within the scope of this standard also incorporates functions that are covered by another Part 2 of IEC 60335, the relevant Part 2 is applied to each function separately, as far as is reasonable. If applicable, the influence of one function on the other is taken into account.

When a Part 2 standard does not include additional requirements to cover hazards dealt with in Part 1, Part 1 applies.

NOTE 1 This means that the technical committees responsible for the Part 2 standards have determined that it is not necessary to specify particular requirements for the appliance in question over and above the general requirements.

This standard is a product family standard dealing with the safety of appliances and takes precedence over horizontal and generic standards covering the same subject.

NOTE 2 Horizontal ~~and generic standards~~ publications, basic safety publications and group safety publications covering a hazard are not applicable since they have been taken into consideration when developing the general and particular requirements for the IEC 60335 series of standards. ~~For example, in the case of temperature requirements for surfaces on many appliances, generic standards, such as ISO 13732-1 for hot surfaces, are not applicable in addition to Part 1 or part 2 standards.~~ **1**

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of the standard if, when examined and tested, it is found to have other features that impair the level of safety covered by these requirements.

An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the intent of the requirements and, if found to be substantially equivalent, may be considered to comply with the standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters. **1**

## HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

### Part 2-59: Particular requirements for insect killers

#### 1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **insect killers** for household and similar purposes, their **rated voltage** being not more than 250 V, including direct current (DC) supplied appliances and **battery-operated appliances**. **1**

Appliances not intended for normal household use but that nevertheless ~~may~~ can be a source of danger to the public, such as appliances intended to be used by laymen in shops, in light industry and on farms, are within the scope of this standard.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account

- persons (including children) whose
  - physical, sensory or mental capabilities; or
  - lack of experience and knowledgeprevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

~~NOTE 101~~—Attention is drawn to the fact that <https://standards.iteh.ai/iec-60335-2-59-2021>

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements ~~may~~ can be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

~~NOTE 102~~—This standard does not apply to

- appliances that function by emitting vaporized chemicals;
- appliances emitting ultrasonic waves;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).

~~NOTE 103~~—For appliances provided with discharge lamps or tungsten filament lamps, IEC 60598-1 also applies as far as is reasonable.

#### 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60068-2-52:~~1996~~, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

### 3 Terms and definitions

This clause of Part 1 is applicable except as follows.

#### 3.1 Definitions relating to physical characteristics

##### 3.1.9 ~~Replacement~~ Addition: **2** **normal operation**

operation of the appliance under the following conditions:

- the output circuit is short-circuited;
- the grids are separated by the maximum distance for maintaining an arc, the appliance being operated in cycles consisting of 1 s of operation followed by a rest period of 2 s;
- a resistive load is connected between the grids and adjusted to obtain the maximum current

##### ~~3.102~~ 1.101 **effective irradiance**

irradiance of electromagnetic radiation weighted according to a specific action curve

#### 3.5 Definitions relating to types of appliances

##### 3.5.101 **insect killer**

appliance that electrocutes insects by applying a voltage between two or more grids

### 4 General requirement

This clause of Part 1 is applicable. [IEC 60335-2-59:2021](https://standards.iteh.ai/catalog/standards/iec/1bd96b29-cf06-4fcc-aab7-e74d7a085045/iec-60335-2-59-2021)

### 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

**5.101** *For each test, the most unfavourable condition specified in 3.1.9 is used.*

**5.102** *Insect killers are tested as motor-operated appliances.*

### 6 Classification

This clause of Part 1 is applicable except as follows.

**6.1** *Modification:*

**Insect killers** shall be **class I** or **class II**.

**6.2** *Addition:*

**Insect killers** intended for outdoor use shall be at least IPX4.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

Appliances shall be marked with symbol ~~5036 of IEC 60417-1~~ IEC 60417-5036 (2002-10) or with the substance of the following:

DANGER: High voltage

Appliances provided with replaceable lamps shall be marked with the type reference of the lamp.

Appliances containing lamps that cannot be replaced without breaking or destroying the appliance shall be marked with the substance of the following:

WARNING: The lamps in this appliance cannot be replaced. Scrap the appliance when the lamps cease to operate.

### 7.6 Addition:



~~[symbol 5036 of IEC 60417-1] dangerous voltage~~



[symbol IEC 60417-5036 (2002-10)] dangerous voltage

### 7.12 Addition:

The instructions shall state whether the appliance is for indoor use only or suitable for outdoor use.

The instructions for appliances for indoor use only shall state that they are not suitable for use in barns, stables and similar locations.

The instructions for appliances intended for outdoor use shall include the substance of the following:

WARNING: An electric shock hazard may exist if water from a garden hose is directed at the insect killer.

When using extension cords, keep the socket-outlet away from moisture and avoid damage to the cord.

The instructions shall state the substance of the following:

- the appliance is to be kept out of reach of children;
- the appliance is not to be used in locations where flammable vapour or explosive dust is likely to exist.

The instructions shall give details concerning

- the method and frequency of cleaning, together with the precautions to be taken;
- precautions to be taken when replacing lamps and starters, if applicable.

If symbol ~~5036 of IEC 60417-1~~ IEC 60417-5036 (2002-10) is used, its meaning shall be explained.

#### 7.14 Addition:

The height of symbol ~~5036 of IEC 60417-1~~ IEC 60417-5036 (2002-10) shall be at least 10 mm.

The height of the lettering of the warning relating to high voltage shall be at least 3 mm.

*Compliance is checked by measurement.*

## 8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

### 8.1.1 Modification:

*Test probe 18 of IEC 61032 is not applied to appliances that according to the instructions are required to be mounted at a height exceeding 1,8 m above the floor. 3*

*Addition:*

*When the grid voltage is obtained from an isolating transformer, the test probe may touch earthed parts of the secondary circuit.*

## 9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

## 10 Power input and current

This clause of Part 1 is applicable.

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## 11 Heating

This clause of Part 1 is applicable except as follows.

### 11.3 Addition:

*Where the external **accessible surfaces** are suitably flat and access permits, then the test probe of Figure 101 is used to measure the temperature rises of external **accessible surfaces** specified in Table 101. The probe is applied with a force of  $4\text{ N} \pm 1\text{ N}$  to the surface in such a way that the best possible contact between the probe and the surface is ensured. The measurement is performed after a contact period of 30 s.*

*The probe may be held in place using a laboratory stand clamp or similar device. Any measuring instrument giving the same results as the probe may be used. 4*

### 11.7 ~~Replacement~~ Modification: 5

*For appliances incorporating **integral batteries** or **separable batteries** not disconnected from the appliance for charging purposes, the **battery** that has been **fully discharged** is charged for 1 h, while the appliance is operated performing its intended function as specified for normal operation, if allowed by the construction of the appliance.*

*Addition:*

*Appliances are operated until steady conditions are established.*

**11.8 Modification:**

*During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. 4*

*Addition:*

*The temperature rise of handles or grips of vents and air shutters shall not exceed the value specified in Table 3 for surfaces of handles, knobs, grips and similar parts which are held for short periods only in normal use.*

*The temperature rise of surfaces likely to collect dust or insects shall not exceed 60 K.*

**NOTE 101**—*Surfaces having an inclination of at least 60° to the horizontal and parts having a diameter less than 10 mm are not considered likely to collect dust or insects.*

**Table 101 – Maximum temperature rises for specified external accessible surfaces under normal operating conditions**

| Surface  | Temperature rise of external accessible surfaces <sup>a</sup><br>K |
|--|--|
| Bare metal   | 42   |
| Coated metal <sup>b</sup>  | 49   |
| Glass and ceramic  | 56   |
| Plastic and plastic coating > 0,4 mm <sup>c, d</sup>   | 62   |
| NOTE 101 The temperature rise limits of knobs, grips, keyboards, keypads and similar parts are specified in Table 3.   |  |
| <sup>a</sup> Temperature rises on surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end, applied with a force not exceeding 1 N are not measured.  |  |
| <sup>b</sup> Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel or non-substantially plastic coating is used.  |  |
| <sup>c</sup> The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.  |  |
| <sup>d</sup> When the thickness of the plastic coating does not exceed 0,4 mm, the temperature rise limits of coated metal for underlying metal apply or the temperature rise limits for glass or ceramic material for underlying glass or ceramic material apply. |  |

**12 ~~Void~~ Charging of metal-ion batteries 1**

This clause of Part 1 is applicable.

**13 Leakage current and electric strength at operating temperature**

This clause of Part 1 is applicable.

**14 Transient overvoltages**

This clause of Part 1 is applicable.