IEC 60335-2-65

Edition 3.0 2023-12
COMMENTED VERSION

INTERNATIONAL STANDARD

colour inside

Household and similar electrical appliances – Safety –
Part 2-65: Particular requirements for air-cleaning appliances

IEC Secretariat
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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-65: Particular requirements for air-cleaning appliances

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 60335-2-65:2023 edition 3.0 allows the user to identify the changes made to the previous IEC 60335-2-65:2002+AMD1:2008+AMD2:2015 CSV edition 2.2. Furthermore, comments from IEC TC 61 experts are provided to explain the reasons of the most relevant changes, or to clarify any part of the content.

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 60335-2-65 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This third edition cancels and replaces the second edition published in 2002, Amendment 1:2008 and Amendment 2:2015. This edition constitutes a technical revision.

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

a) alignment with IEC 60335-1:2020;
b) deletion or conversion to normative text for some notes (Clause 1, 11.8, 16.101);
c) addition of temperature rise limits for accessible surface (Clause 11);
d) introduction of test probe 19 (8.1.1, 20.2, B.22.3, B.22.4);
e) modification of definition of air-cleaning appliance to include self-contained appliance having treatment system other than filter (3.5.101);
f) addition of symbol IEC 60417-6040 for UV radiation air-cleaning appliances in place of the substance of the marking (7.1, 7.6, 7.12);
g) clarifications on remote operation for air cleaning appliances (22.40, 22.49,22.51);
h) removal of requirements for UV-C resistant materials and UV exposure that are now covered by Part 1 (22.106, 23.101, 32.102, Annex AA).

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

Draft	Report on voting
61/7012/FDIS	61/7074/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 air-cleaning appliances.

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 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 can 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.

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~~ can 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~~ Horizontal 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. **2**

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-65: Particular requirements for air-cleaning appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **air-cleaning appliances** for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances including direct current (DC) supplied appliances and **battery-operated appliances**. 3

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 knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

~~NOTE 101~~ Attention is drawn to the fact that

– 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

– **air-cleaning appliances** where harmful radiation is intentionally emitted from the appliance; 4
– appliances intended exclusively for industrial purposes;
– 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);
– air-cleaning systems incorporated in the building structure;
– appliances for medical purposes (IEC 60601 series). 5

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

~~ISO 4892-2:2013, *Plastics – Methods of exposure to laboratory light sources – Part 2: Xenon-arc lamps*~~

~~ISO 4892-4:2013, *Plastics – Methods of exposure to laboratory light sources – Part 4: Open-flame carbon-arc lamps*~~

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*~~ *Modification:*

Replace the first paragraph with the following: **6**

~~**normal operation**~~
operation of the appliance as supplied or with high-voltage output circuits short-circuited, whichever is more unfavourable

3.5 Definitions relating to types of appliances

3.5.101
air-cleaning appliance
self-contained appliance having a filter system or other treatment system that ~~may~~ can incorporate means for ionizing the air **7**

3.5.102
UV-C emitter
radiating source constructed to emit non-ionizing electromagnetic energy at wavelengths of 100 nm to 280 nm

3.5.103
UV radiation air-cleaning appliance
appliance that incorporates **UV-C emitters** to inactivate air-borne microbes

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.101 *Appliances are tested as **motor-operated appliances**.*

6 Classification

This clause of Part 1 is applicable.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

UV radiation air-cleaning appliances containing replaceable **UV-C emitters** shall be marked with the type reference of the emitter and with the symbol IEC 60417-6040 (2010-08) **8** or the substance of the following warning:

WARNING: UV radiation is dangerous for the eyes and skin. Do not operate the UV-C emitter outside the appliance.

If it is intended that replacement of the **UV-C emitter** can be carried out by the user, the appliance shall be marked with the substance of "Read the instructions" or with symbol ISO 7000-0790 (2004-01).

7.6 *Addition:*

[symbol IEC 60417-6040 (2010-08)]

ultraviolet radiation, instructional safeguard **9**

7.12 *Addition:*

The instructions shall include details for cleaning and other **user maintenance** of the appliance. They shall state that prior to cleaning or other maintenance, the appliance must be disconnected from the supply mains.

The instructions for **UV radiation air-cleaning appliances** shall give details concerning:

– the method, frequency of cleaning, and necessary precautions to be taken;
– precautions to be taken when replacing **UV-C emitters** and starters, if applicable.

The instructions of appliances containing **UV-C emitters** shall ~~contain the substance of~~ include the following:

– If the replacement of the **UV-C emitter** by the user is not allowed, this must be clearly stated; and
– the substance of the following:
  - This appliance contains a UV-C emitter;
  - Appliances that are obviously damaged must not be operated;
  - Unintended use of the appliance or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin.

The instructions of appliances containing replaceable **UV-C emitters** shall also contain the substance of the following:

– Read the maintenance instructions before opening the appliance;
– The appliance must be disconnected from the supply before replacing the UV-C emitter;
– Replaceable UV-C emitters must only be replaced by the types indicated in the instructions;
– Replacing ozone-free UV-C emitters with those that are not ozone-free can cause health hazards to people in the area where the device is operated. **10**

If the symbol IEC 60417-6040 (2010-08) is used, the meaning shall be explained. **11**

7.12.1 *Addition:*

Instructions for **fixed appliances** intended for installation above 850 mm in normal use shall include the substance of the following:

Do not mount this product lower than 850 mm from the floor. **12**

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

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. **13**

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18. **14**

8.1.3 *Addition:*

Test probe 19 of IEC 61032 is not applied.

8.1.4 *Addition:*

*The discharge from parts that are only accessible after the removal of a cover for cleaning or other **user maintenance** is measured 2 s after the cover has been removed.*

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.

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 N ± 1 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. **15**

11.7 ~~*Replacement*~~ *Modification:*

Replace the first paragraph with the following: **16**

Appliances are operated until steady conditions are established.

11.8 *Modification:*

Replace the first paragraph with the following:

During the test, the temperature rises are monitored continuously and shall not exceed the values shown in Table 3 and Table 101. **17**

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. **18**

~~NOTE 101~~ *Operation of a current-limiting device in a high-voltage circuit is allowed.*

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

Surface	*Temperature rise of external accessible surfaces* [a] *K*	
	Surfaces situated not more than 850 mm from the floor when installed or in normal use	*Other surfaces*
Bare metal	*38*	*42*
Coated metal [b]	*42*	*49*
Glass and ceramic	*51*	*56*
Plastic and plastic coating > 0,4 mm [c, d]	*58*	*62*

NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.

[a] *Temperature rise on surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end are not measured.*

[b] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.*

[c] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[d] *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

This clause of Part 1 is applicable. **19**

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.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.101 High-voltage transformers shall have adequate internal insulation.

Compliance is checked by the following test.

*Twice the **working voltage** is induced in the secondary winding of the transformer by applying a sinusoidal voltage having a frequency higher than **rated frequency** to the primary terminals.*

The duration of the test is

– *60 s, for frequencies up to twice the **rated frequency**, or*

– $120 \times \frac{\textbf{rated frequency}}{\text{test frequency}}$ *s, with a minimum of 15 s, for higher frequencies.*

~~NOTE The frequency of the test voltage is higher than **rated frequency** to avoid excessive excitation current.~~

A maximum of one-third of the test voltage is applied and is then rapidly increased without creating transients. At the end of the test, the voltage is decreased in ~~a similar~~ the same manner to approximately one-third of its full value before switching off.

There shall be no breakdown between windings or between adjacent turns of the same winding.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 *Addition:*

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. **20**

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18 **21**. *During the test with test probe 19, the appliance is assembled without any filters removed.* **22**

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 *Addition:*

These appliances are not considered to be appliances that could give rise to a hazard when operated continuously, automatically or remotely.

22.49 Not applicable.

22.51 Not applicable. **23**

22.101 Appliances shall not have openings on the underside that would allow small items to penetrate and touch **live parts**.

*Compliance is checked by inspection and by measuring the distance between the supporting surface and **live parts** through openings. This distance shall be at least 6 mm. However, if the appliance is fitted with legs, this distance is increased to 10 mm if the appliance is intended to stand on a table and to 20 mm if it is intended to stand on the floor.*

22.102 Interlock switches that prevent access to **live parts** during **user maintenance** shall be connected in the input circuit and located to prevent unintentional operation.

Compliance is checked by inspection and by applying test probe B of IEC 61032 with a force of 10 N. **24**

22.103 **UV radiation air-cleaning appliances** shall not emit UV radiation in hazardous amounts:

– before, during or after installation;
– during operation;
– during maintenance;
– during cleaning;
– during replacement of the **UV-C emitter**.

*Compliance is checked by inspection and by the tests of Clause 32. If a switch is used to de-energize the **UV-C emitter** so as to meet the requirement, it shall not be possible to operate the switch ~~with~~ by applying test probe B of IEC 61032 with a force of 10 N.* **25**

22.104 If the replacement of the **UV-C emitter** by the user is allowed, the appliance shall be constructed so that

– the replacement of the **UV-C emitter** is easily possible;
– if screws or components are omitted or incorrectly positioned or fastened, the appliance is rendered inoperable or manifestly incomplete;
– the **UV-C emitter** is deactivated by an interlock actuated by opening or removing of a part to gain access.

Compliance is checked by inspection and by manual test.

22.105 If the replacement of the **UV-C emitter** by the user is not intended, this shall be prevented by the construction of the appliance.

Compliance is checked by inspection and, if necessary, by manual test.

NOTE The requirement can be met if the emitter can only be replaced by the manufacturer or its service agent together with a part of the appliance.

~~**22.106** Parts of organic material that are exposed to direct or reflected UV-C radiation shall be UV-C resistant.~~

~~*Compliance is checked by inspection and, if necessary, by manual test.*~~ **26**

23 Internal wiring

This clause of Part 1 is applicable ~~except as follows~~.

~~**23.101** Internal wiring that is exposed to direct or reflected UV-C radiation shall be UV-C resistant.~~

~~*Compliance is checked by the following test.*~~

~~*Samples of the internal wiring are conditioned in accordance with Annex AA.*~~

~~*On completion of the conditioning, the cable is wrapped in metal foil and is wound around a conductive mandrel 15 mm in diameter for three turns. A voltage of 2 000 V is applied for 15 min between the conductor and the mandrel. There shall be no break down.*~~ **27**

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 *Addition:*

Interlock switches are operated 1 000 times.

24.101 Interlock switches that prevent access to **live parts** during **user maintenance** shall

– disconnect all poles, unless the secondary circuit is supplied through an isolating transformer;
– have a contact separation that provides full disconnection in accordance with IEC 61058-1:2016.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type Z attachment is allowed for appliances having a mass not exceeding 3 kg.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.2 Not applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is ~~replaced by the following~~ applicable except as follows.

32.101 The ozone concentration produced by **air-cleaning appliances** shall not be excessive.

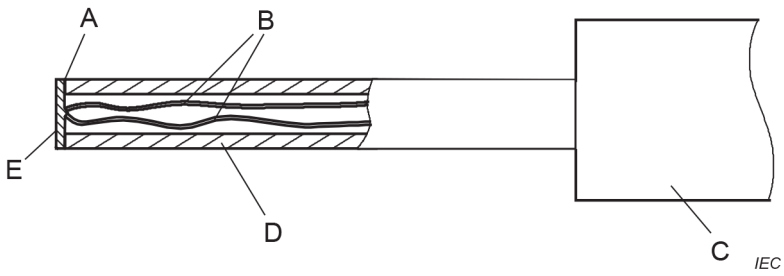
Compliance is checked by the following test, which is carried out in a room without openings having dimensions of 2,5 m × 3,5 m × 3,0 m, the walls being covered with polyethylene sheet. If the instructions state that the appliance is to be fixed in a room having a volume exceeding 30 m^3, the dimensions of the test room are increased accordingly.

The appliance is positioned in accordance with the instructions. Appliances used on a table are placed in the centre of the room approximately 750 mm above the floor.

*The room is maintained at approximately 25 °C and 50 % relative humidity. The appliance is supplied at **rated voltage** for 24 h, removable filters being removed if this is more unfavourable.*

The ozone sampling tube is to be located in the air stream 50 mm from the air outlet of the appliance. The background ozone concentration measured prior to the test is subtracted from the maximum concentration measured during the test.

The percentage of ozone in the room shall not exceed 5×10^{-6}.



Key

A adhesive

B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

~~**32.102** Appliances shall not emit radiation in hazardous amount.~~

~~*Compliance is checked by the followings test.*~~

~~*The appliance is supplied at **rated voltage** and operated under **normal operation**. The irradiance is measured at a distance of 300 mm, the measuring instrument being positioned so that the highest radiation is recorded. If the appliance has an inspection window, the measuring distance is reduced to 0 mm.*~~

~~*The measuring instrument used shall measure the mean irradiance over a circular area having a diameter not exceeding 20 mm. The response of the instrument shall be proportional to the cosine of the angle between incident radiation and the normal to the circular area. The spectral irradiance shall be measured at intervals not exceeding 2,5 nm in an appropriate spectro-radiometric system. The spectro-radiometer shall have a bandwidth not exceeding 2,5 nm.*~~

~~NOTE 1 A bandwidth of 1 nm is advisable for greater measurement accuracy in cases where a rapid change of the spectral energy occurs within a small bandwidth area.~~

~~*The irradiance is measured when the radiation from the **UV-C emitter** has stabilized. Appliances shall have a total irradiance not exceeding 0,003 W/m^2, for wavelengths between 200 nm and 280 nm. The spectral irradiance shall not exceed 10^{-5} Wm^{-2}nm^{-1}.*~~

~~NOTE 2 The total irradiance is given by~~

$$I = \sum_{200\,\mathrm{mm}}^{280\,\mathrm{mm}} E_\lambda \Delta\lambda$$

~~where~~

~~I is the total irradiance;~~

~~E_λ is the spectral irradiance in Wm^{-2}nm^{-1};~~

$\Delta\lambda$ is the wavelength interval in nm.

The total irradiance shall not exceed 1 mW/m^2 for wavelengths between 250 nm and 400 nm.

NOTE 3 The total irradiance is given by

$$E = \sum_{250\ mm}^{400\ mm} S_\lambda E_\lambda \Delta\lambda$$

where

E is the total effective irradiance;

E_λ is the spectral irradiance in Wm^{-2}nm^{-1};

S_λ is the weighting factor specified in Table 1;

$\Delta\lambda$ is the wavelength interval in nm. **28**

Table 1 – Weighting factors for different wavelengths

Wavelength	Weighting factor		Wavelength	Weighting factor		Wavelength	Weighting factor
nm	(S_λ)		nm	(S_λ)		nm	(S_λ)
250	0,430		308	0,026		335	0,000 34
254	0,500		310	0,015		340	0,000 28
255	0,520		313	0,006		345	0,000 24
260	0,650		315	0,003		350	0,000 20
265	0,810		316	0,002 4		355	0,000 16
270	1,000		317	0,002 0		360	0,000 13
275	0,960		318	0,001 6		365	0,000 11
280	0,880		319	0,001 2		370	0,000 093
285	0,770		320	0,001 0		375	0,000 077
290	0,640		322	0,000 67		380	0,000 064
295	0,540		323	0,000 54		385	0,000 053
297	0,460		325	0,000 50		390	0,000 044
300	0,300		328	0,000 44		395	0,000 036
303	0,120		330	0,000 41		400	0,000 030
305	0,060		333	0,000 37			

NOTE The weighting factors for intermediate wavelengths are determined by interpolation.

Annexes

The annexes of Part 1 are applicable except as follows:

~~Annex AA~~
~~(normative)~~

~~UV radiation conditioning~~

~~**AA.1** Ten samples of the internal wiring are subjected to ultraviolet light conditioning according to Clause AA.2 or AA.3. When the internal wiring is provided in more than one colour, ten samples of each colour are subjected to this conditioning.~~

~~The test samples are mounted on the inside of the cylinder in the ultraviolet light apparatus perpendicular to the light source and in such a way that the samples do not touch each other.~~

~~**AA.2** The samples are to be exposed for 1 000 h to xenon-arc, method A, in accordance with ISO 4892-2. There shall be continuous exposure to light and intermittent exposure to water spray. The cycle shall consist of 102 min without water spray and 18 min with water spray. The apparatus shall operate with a water-cooled xenon-arc lamp, borosilicate glass inner and outer optical filters, a spectral irradiance of 0,35 W/m^2/nm at 340 nm and a black panel temperature of (65 ± 3) °C. The temperature of the chamber shall be (45 ± 3) °C. The relative humidity in the chamber shall be (50 ± 5) %.~~

~~**AA.3** The samples are to be exposed for 720 h to open-flame sunshine carbon-arc, in accordance with ISO 4892-4. There shall be continuous exposure to light and intermittent exposure to water spray. The cycle shall consist of 102 min without water spray and 18 min with water spray. The apparatus shall operate with an open-flame sunshine carbon-arc lamp, borosilicate glass Type 1 inner and outer optical filters, a spectral irradiance of 0,35 W/m^2/nm at 340 nm and a black panel temperature of (63 ± 3) °C. The temperature of the chamber shall be (45 ± 3) °C. The relative humidity in the chamber shall be (50 ± 5) %.~~ **29**

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

22 Construction

B.22.3 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

B.22.4 *Addition:*

*For **batteries** situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.* **30**

Bibliography

The bibliography of Part 1 is applicable.

List of comments

1 This revision is for alignment with IEC 60335-1:2020.

2 This revision is for alignment with IEC 60335-1:2020.

3 This revision is for alignment with IEC 60335-1:2020.

4 There are air cleaning appliances that use intentional emission of UV radiation into an unoccupied room in order to clean the air. These types of appliances are not covered by this standard.

5 This is added because air cleaners for medical purposes are not covered by this standard.

6 This revision maintains the normal operation while charging as specified in IEC 60335-1:2020.

7 The definition of air-cleaning appliance is modified to include appliance having treatment system other than a filter.

8 The symbol IEC 60417-6040 for UV radiation air-cleaning appliances is added as an alternative to the substance of the marking.

9 The symbol IEC 60417-6040 for UV radiation air-cleaning appliances is added as an alternative to the substance of the marking in 7.1.

10 This revision is intended to separate the information to be provided in the instructions from the "substance of" wording to be provided in the instructions.

11 It is common to require the meaning of symbols used in place of marking text to be explained in the instructions.

12 Appliances located above 850 mm are not considered to be within reach of children up to 3 years in age, so test probe 19 is not applied in Subclauses 8.1.1 and 20.2 and higher surface temperature limits are allowed by Table 101.

13 Appliances located above 1,8 m are not considered to be within reach of children up to 14 years in age according to IEC Guide 117, so test probe 18 is not applied.

14 Air cleaning appliance can be located on the floor where they would be accessible to children up to 3 years in age. However, appliances located above 850 mm are not considered to be within reach of these children, so test probe 19 is not applied.

15 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.

16 This revision maintains the Part 1 requirements for appliance outlets and socket outlets and for charging of battery-operated appliances.

17 Limits on the temperature rise of external accessible surfaces are introduced to address the risk of thermal injury from contact with external accessible surfaces based on IEC Guide 117 for Temperatures of touchable hot surfaces.

18 This addition clarifies that these parts are considered to be held for short periods only.

19 This revision is for alignment with IEC 60335-1:2020.

20 Appliances located above 1,8 m are not considered to be within reach of children up to 14 years in age according to IEC Guide 117, so test probe 18 is not applied.

21 Air cleaning appliance can be located on the floor where they would be accessible to children up to 3 years in age. However, appliances located above 850 mm are not considered to be within reach of these children, so test probe 19 is not applied.

22 Children up to 3 years in age will have access to the appliance when it is assembled as in normal use.

23 Additional requirements for remote operation were added to IEC 60335-1:2020. However, the remote operation requirements in Subclauses 22.40, 22.49 and 22.51 are not applicable for appliances covered by this Part 2 standard because they are not considered to give rise to a hazard when operated continuously, automatically or remotely.

24 The force applied is specified to align with the force specified in IEC 61032, Table 1.

25 The force applied is specified to align with the force specified in IEC 61032, Table 1.

26 Requirements for UV-C resistance of materials are now covered by Subclause 22.57 and Annex T of Part 1.

27 Requirements for UV-C resistance of internal wiring materials are now covered by Subclause 22.57 and Annex T of Part 1.

28 Requirements for UV-C exposure are now covered by Subclauses 24.1.10 and 32.2 of Part 1.

29 Requirements for UV-C resistance of internal wiring materials are now covered by Subclause 22.57 and Annex T of Part 1.

30 Battery-operated air cleaning appliance can be located on the floor where they would be accessible to children up to 3 years in age, so test probe 19 is applied to battery-operated appliances, detachable battery packs and separable battery packs.

IEC 60335-2-65

Edition 3.0 2023-12

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household and similar electrical appliances – Safety –
Part 2-65: Particular requirements for air-cleaning appliances

Appareils électrodomestiques et analogues – Sécurité –
Partie 2-65: Exigences particulières pour les épurateurs d'air

IEC 60335-2-65:2023-12(en-fr)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-65: Particular requirements for air-cleaning appliances

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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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 60335-2-65 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This third edition cancels and replaces the second edition published in 2002, Amendment 1:2008 and Amendment 2:2015. This edition constitutes a technical revision.

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

a) alignment with IEC 60335-1:2020;
b) deletion or conversion to normative text for some notes (Clause 1, 11.8, 16.101);
c) addition of temperature rise limits for accessible surface (Clause 11);
d) introduction of test probe 19 (8.1.1, 20.2, B.22.3, B.22.4);

e) modification of definition of air-cleaning appliance to include self-contained appliance having treatment system other than filter (3.5.101);

f) addition of symbol IEC 60417-6040 for UV radiation air-cleaning appliances in place of the substance of the marking (7.1, 7.6, 7.12);

g) clarifications on remote operation for air cleaning appliances (22.40, 22.49,22.51);

h) removal of requirements for UV-C resistant materials and UV exposure that are now covered by Part 1 (22.106, 23.101, 32.102, Annex AA).

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

Draft	Report on voting
61/7012/FDIS	61/7074/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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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 air-cleaning appliances.

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 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 can 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.

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 can 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 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.

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.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-65: Particular requirements for air-cleaning appliances

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **air-cleaning appliances** for household and similar purposes, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances including direct current (DC) supplied appliances and **battery-operated appliances**.

Appliances not intended for normal household use but that nevertheless 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 knowledge

  prevents them from using the appliance safely without supervision or instruction;
– children playing with the appliance.

Attention is drawn to the fact that

– for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements 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.

This standard does not apply to

– **air-cleaning appliances** where harmful radiation is intentionally emitted from the appliance;
– appliances intended exclusively for industrial purposes;
– 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);
– air-cleaning systems incorporated in the building structure;
– appliances for medical purposes (IEC 60601 series).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60584-1, *Thermocouples – Part 1: EMF specifications and tolerances*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to physical characteristics

3.1.9 *Modification:*

Replace the first paragraph with the following:

operation of the appliance as supplied or with high-voltage output circuits short-circuited, whichever is more unfavourable

3.5 Definitions relating to types of appliances

3.5.101
air-cleaning appliance
self-contained appliance having a filter system or other treatment system that can incorporate means for ionizing the air

3.5.102
UV-C emitter
radiating source constructed to emit non-ionizing electromagnetic energy at wavelengths of 100 nm to 280 nm

3.5.103
UV radiation air-cleaning appliance
appliance that incorporates **UV-C emitters** to inactivate air-borne microbes

4 General requirement

This clause of Part 1 is applicable.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.101 *Appliances are tested as **motor-operated appliances**.*

6 Classification

This clause of Part 1 is applicable.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 *Addition:*

UV radiation air-cleaning appliances containing replaceable **UV-C emitters** shall be marked with the type reference of the emitter and with the symbol IEC 60417-6040 (2010-08) or the substance of the following warning:

WARNING: UV radiation is dangerous for the eyes and skin. Do not operate the UV-C emitter outside the appliance.

If it is intended that replacement of the **UV-C emitter** can be carried out by the user, the appliance shall be marked with the substance of "Read the instructions" or with symbol ISO 7000-0790 (2004-01).

7.6 *Addition:*

[symbol IEC 60417-6040 (2010-08)] ultraviolet radiation, instructional safeguard

7.12 *Addition:*

The instructions shall include details for cleaning and other **user maintenance** of the appliance. They shall state that prior to cleaning or other maintenance, the appliance must be disconnected from the supply mains.

The instructions for **UV radiation air-cleaning appliances** shall give details concerning:

– the method, frequency of cleaning, and necessary precautions to be taken;
– precautions to be taken when replacing **UV-C emitters** and starters, if applicable.

The instructions of appliances containing **UV-C emitters** shall include the following:

– If the replacement of the **UV-C emitter** by the user is not allowed, this must be clearly stated; and
– the substance of the following:
  - This appliance contains a UV-C emitter;
  - Appliances that are obviously damaged must not be operated;
  - Unintended use of the appliance or damage to the housing may result in the escape of dangerous UV-C radiation. UV-C radiation may, even in little doses, cause harm to the eyes and skin.

The instructions of appliances containing replaceable **UV-C emitters** shall also contain the substance of the following:

– Read the maintenance instructions before opening the appliance;
– The appliance must be disconnected from the supply before replacing the UV-C emitter;
– Replaceable UV-C emitters must only be replaced by the types indicated in the instructions;
– Replacing ozone-free UV-C emitters with those that are not ozone-free can cause health hazards to people in the area where the device is operated.

If the symbol IEC 60417-6040 (2010-08) is used, the meaning shall be explained.

7.12.1 *Addition:*

Instructions for **fixed appliances** intended for installation above 850 mm in normal use shall include the substance of the following:

Do not mount this product lower than 850 mm from the floor.

8 Protection against access to live parts

This clause of Part 1 is applicable except as follows.

8.1.1 *Addition:*

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.

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

8.1.3 *Addition:*

Test probe 19 of IEC 61032 is not applied.

8.1.4 *Addition:*

*The discharge from parts that are only accessible after the removal of a cover for cleaning or other **user maintenance** is measured 2 s after the cover has been removed.*

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.

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 N ± 1 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.

11.7 *Modification:*

Replace the first paragraph with the following:

Appliances are operated until steady conditions are established.

11.8 *Modification:*

Replace the first paragraph with the following:

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

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.

Operation of a current-limiting device in a high-voltage circuit is allowed.

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

Surface	***Temperature rise of external accessible surfaces*** [a] ***K***	
	Surfaces situated not more than 850 mm from the floor when installed or in normal use	***Other surfaces***
Bare metal	*38*	*42*
Coated metal [b]	*42*	*49*
Glass and ceramic	*51*	*56*
Plastic and plastic coating > 0,4 mm [c, d]	*58*	*62*
NOTE The temperature rise limits of handles, knobs, grips, keyboards, keypads and similar parts are specified in Table 3.		

[a] *Temperature rise on surfaces that are inaccessible to a 75 mm diameter probe having a hemispherical end are not measured.*

[b] *Metal is considered coated when a coating having a minimum thickness of 90 µm made of enamel, powder or non-substantially plastic coating is used.*

[c] *The temperature rise limit of plastic also applies for plastic material having a metal finish of thickness less than 0,1 mm.*

[d] *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 Charging of metal-ion batteries

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.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable except as follows.

16.101 High-voltage transformers shall have adequate internal insulation.

Compliance is checked by the following test.

*Twice the **working voltage** is induced in the secondary winding of the transformer by applying a sinusoidal voltage having a frequency higher than **rated frequency** to the primary terminals.*

The duration of the test is

– *60 s, for frequencies up to twice the **rated frequency**, or*

– $120 \times \frac{\textbf{rated frequency}}{\text{test frequency}}$ *s, with a minimum of 15 s, for higher frequencies.*

A maximum of one-third of the test voltage is applied and is then rapidly increased without creating transients. At the end of the test, the voltage is decreased in the same manner to approximately one-third of its full value before switching off.

There shall be no breakdown between windings or between adjacent turns of the same winding.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable.

20 Stability and mechanical hazards

This clause of Part 1 is applicable except as follows.

20.2 *Addition:*

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.

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18. During the test with test probe 19, the appliance is assembled without any filters removed.

21 Mechanical strength

This clause of Part 1 is applicable.

22 Construction

This clause of Part 1 is applicable except as follows.

22.40 *Addition:*

These appliances are not considered to be appliances that could give rise to a hazard when operated continuously, automatically or remotely.

22.49 Not applicable.

22.51 Not applicable.

22.101 Appliances shall not have openings on the underside that would allow small items to penetrate and touch **live parts**.

*Compliance is checked by inspection and by measuring the distance between the supporting surface and **live parts** through openings. This distance shall be at least 6 mm. However, if the appliance is fitted with legs, this distance is increased to 10 mm if the appliance is intended to stand on a table and to 20 mm if it is intended to stand on the floor.*

22.102 Interlock switches that prevent access to **live parts** during **user maintenance** shall be connected in the input circuit and located to prevent unintentional operation.

Compliance is checked by inspection and by applying test probe B of IEC 61032 with a force of 10 N.

22.103 **UV radiation air-cleaning appliances** shall not emit UV radiation in hazardous amounts:

– before, during or after installation;
– during operation;
– during maintenance;
– during cleaning;
– during replacement of the **UV-C emitter**.

*Compliance is checked by inspection and by the tests of Clause 32. If a switch is used to de-energize the **UV-C emitter** so as to meet the requirement, it shall not be possible to operate the switch by applying test probe B of IEC 61032 with a force of 10 N.*

22.104 If the replacement of the **UV-C emitter** by the user is allowed, the appliance shall be constructed so that

– the replacement of the **UV-C emitter** is easily possible;
– if screws or components are omitted or incorrectly positioned or fastened, the appliance is rendered inoperable or manifestly incomplete;
– the **UV-C emitter** is deactivated by an interlock actuated by opening or removing of a part to gain access.

Compliance is checked by inspection and by manual test.

22.105 If the replacement of the **UV-C emitter** by the user is not intended, this shall be prevented by the construction of the appliance.

Compliance is checked by inspection and, if necessary, by manual test.

NOTE The requirement can be met if the emitter can only be replaced by the manufacturer or its service agent together with a part of the appliance.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.1.3 *Addition:*

Interlock switches are operated 1 000 times.

24.101 Interlock switches that prevent access to **live parts** during **user maintenance** shall

– disconnect all poles, unless the secondary circuit is supplied through an isolating transformer;
– have a contact separation that provides full disconnection in accordance with IEC 61058-1:2016.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 *Addition:*

Type Z attachment is allowed for appliances having a mass not exceeding 3 kg.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2.2 Not applicable.

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable except as follows.

32.101 The ozone concentration produced by **air-cleaning appliances** shall not be excessive.

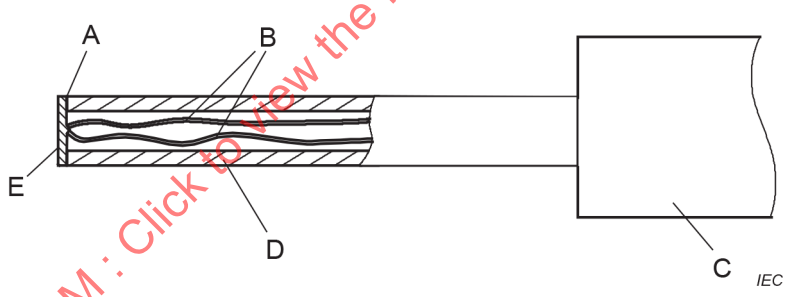
Compliance is checked by the following test, which is carried out in a room without openings having dimensions of 2,5 m × 3,5 m × 3,0 m, the walls being covered with polyethylene sheet. If the instructions state that the appliance is to be fixed in a room having a volume exceeding 30 m^3, the dimensions of the test room are increased accordingly.

The appliance is positioned in accordance with the instructions. Appliances used on a table are placed in the centre of the room approximately 750 mm above the floor.

*The room is maintained at approximately 25 °C and 50 % relative humidity. The appliance is supplied at **rated voltage** for 24 h, removable filters being removed if this is more unfavourable.*

The ozone sampling tube is to be located in the air stream 50 mm from the air outlet of the appliance. The background ozone concentration measured prior to the test is subtracted from the maximum concentration measured during the test.

The percentage of ozone in the room shall not exceed 5 × 10^{-6}.



Key

A adhesive

B thermocouple wires 0,3 mm diameter to IEC 60584-1 Type K

C handle arrangement permitting a contact force of 4 N ± 1 N

D polycarbonate tube: inside diameter 3 mm, outside diameter 5 mm

E tinned copper disc: 5 mm diameter, 0,5 mm thick with a flat contact face

Figure 101 – Probe for measuring surface temperatures

Annexes

The annexes of Part 1 are applicable except as follows:

Annex B
(normative)

Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances

Annex B of Part 1 is applicable except as follows.

22 Construction

B.22.3 *Addition:*

For parts of appliances situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.

B.22.4 *Addition:*

*For **batteries** situated not more than 850 mm above the floor after installation or in normal use, in addition to the use of test probe 18, test probe 19 of IEC 61032 is also applied as specified for test probe 18.*

Bibliography

The bibliography of Part 1 is applicable.

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SOMMAIRE

COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-65: Exigences particulières pour les épurateurs d'air

AVANT-PROPOS

1) La Commission Électrotechnique 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.
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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.
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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'avait 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 de tels droits de brevets.

L'IEC 60335-2-65 a été établie par le comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette troisième édition annule et remplace la deuxième édition parue en 2002, l'Amendement 1:2008 et l'Amendement 2:2015. Cette édition constitue une révision technique.

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

a) le texte a été aligné sur l'IEC 60335-1:2020;
b) certaines notes ont été supprimées ou converties en texte normatif (Article 1, 11.8, 16.101);
c) des limites d'échauffement ont été ajoutées pour les surfaces accessibles (Article 11);
d) l'application du calibre d'essai 19 a été ajoutée (8.1.1, 20.2, B.22.3, B.22.4) ;
e) modification de la définition d'un épurateur d'air afin d'inclure les appareils autonomes dotés d'un système de traitement autre qu'un filtre (3.5.101);
f) ajout du symbole IEC 60417-6040 pour les épurateur d'air à rayonnement UV à la place du marquage (7.1, 7.6, 7.12);
g) clarification du fonctionnement à distance des épurateurs d'air (22.40, 22.49, 22.51);
h) suppression des exigences relatives aux matériaux résistants aux UV-C et à l'exposition aux UV qui sont désormais couvertes par la partie 1 (22.106, 23.101, 32.102, annexe AA).

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

Projet	Rapport de vote
61/7012/FDIS	61/7074/RVD

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.

La présente partie 2 doit être utilisée conjointement avec la dernière édition de l'IEC 60335-1 et ses amendements sauf si cette édition l'exclut. Dans ce cas, la dernière édition qui n'exclut pas la présente partie 2 est utilisée. Elle a été établie sur la base de la sixième édition (2020) de cette norme.

NOTE 1 L'expression "la Partie 1" utilisée dans la présente norme fait référence à l'IEC 60335-1.

La présente partie 2 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les épurateurs d'air.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette partie 2, ce paragraphe s'applique pour autant que cela soit raisonnable. Lorsque la présente norme mentionne "addition", "modification" ou "remplacement", le texte correspondant de la Partie 1 doit être adapté en conséquence.

NOTE 2 Le système de numérotation suivant est utilisé:

– les paragraphes, tableaux et figures qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101;
– à l'exception de celles qui sont dans un nouveau paragraphe ou de celles qui concernent des notes de la Partie 1, les notes sont numérotées à partir de 101, y compris celles des articles ou paragraphes qui sont remplacés;
– les annexes qui sont ajoutées sont désignées AA, BB, etc.

NOTE 3 Les caractères d'imprimerie suivants sont utilisés:

– exigences: caractères romains;
– *modalités d'essais: caractères italiques*;
– notes: petits caractères romains.

Les termes en **gras** dans le texte sont définis à l'Article 3. Lorsqu'une définition concerne un adjectif, l'adjectif et le nom associé figurent également en gras.

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,
- remplacé par une édition révisée, ou
- amendé.

NOTE 4 L'attention des Comités nationaux est attirée sur le fait que les fabricants d'appareils et les organismes d'essai peuvent avoir besoin d'une période transitoire après la publication d'une nouvelle publication IEC, ou d'une publication amendée ou révisée, pour fabriquer des produits conformes aux nouvelles exigences et pour adapter leurs équipements aux nouveaux essais ou aux essais révisés.

Le comité recommande que le contenu de cette publication soit adopté pour application nationale (obligatoire) au plus tôt 12 mois et au plus tard 36 mois après la date de publication.

INTRODUCTION

Il a été admis par hypothèse, en établissant la présente Norme internationale, que l'exécution de ses dispositions était confiée à des personnes expérimentées et ayant une qualification appropriée.

Les documents de recommandations concernant l'application des exigences de sécurité pour les appareils peuvent être consultés dans les documents de support du CE 61, accessibles sur le site web de l'IEC à l'adresse:

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

Cette information est donnée à l'intention des utilisateurs de la présente Norme internationale et ne constitue nullement un remplacement du texte normatif de la présente norme.

La présente norme reconnaît le niveau de protection internationalement accepté contre les dangers électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions du fabricant. Elle couvre également les situations anormales auxquelles on peut s'attendre dans la pratique et elle tient compte de la façon dont les phénomènes électromagnétiques peuvent affecter le fonctionnement sûr des appareils.

La présente norme tient compte autant que possible des exigences de l'IEC 60364, de façon à rester compatible avec les règles d'installation quand l'appareil est raccordé au réseau d'alimentation. Cependant, des règles nationales d'installation peuvent être différentes.

Si un appareil relevant du domaine d'application de la présente norme comporte également des fonctions couvertes par une autre partie 2 de l'IEC 60335, la partie 2 correspondante est appliquée à chaque fonction séparément, dans la limite du raisonnable. Si cela s'applique, l'influence d'une fonction sur les autres fonctions est prise en compte.

Lorsqu'une partie 2 ne comporte pas d'exigences complémentaires pour couvrir les dangers traités dans la Partie 1, la Partie 1 s'applique.

NOTE 1 Cela signifie que les comités d'études responsables pour les Parties 2 ont déterminé qu'il n'était pas nécessaire de spécifier des exigences particulières pour l'appareil en question en plus des exigences générales.

La présente norme est une norme de famille de produits traitant de la sécurité d'appareils et a préséance sur les normes horizontales et génériques couvrant le même sujet.

NOTE 2 Les publications horizontales, les publications fondamentales de sécurité et les publications groupées de sécurité couvrant un danger ne s'appliquent pas, parce qu'elles ont été prises en considération lorsque les exigences générales et particulières ont été étudiées pour la série de normes IEC 60335.

Un appareil conforme au texte de la présente norme ne sera pas nécessairement jugé conforme aux principes de sécurité de la norme si, lorsqu'il est examiné et soumis aux essais, il apparaît qu'il présente d'autres caractéristiques qui compromettent le niveau de sécurité visé par ces exigences.

Un appareil utilisant des matériaux ou présentant des modes de construction différents de ceux décrits dans les exigences de la présente norme peut être examiné et soumis aux essais en fonction de l'objectif poursuivi par ces exigences et, s'il est jugé pratiquement équivalent, il peut être estimé conforme aux principes de sécurité de la présente norme.

NOTE 3 Les normes traitant des aspects non relatifs à la sécurité des appareils électrodomestiques sont:

– les normes IEC publiées par le comité d'études 59 concernant les méthodes de mesure d'aptitude à la fonction;
– les normes CISPR 11 et CISPR 14-1, ainsi que les normes applicables de la série IEC 61000-3 concernant les émissions électromagnétiques;
– la norme CISPR 14-2 concernant l'immunité électromagnétique;
– les normes IEC publiées par le comité d'études 111 concernant l'environnement.

APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES – SÉCURITÉ –

Partie 2-65: Exigences particulières pour les épurateurs d'air

1 Domaine d'application

L'article de la Partie 1 est remplacé par le texte suivant.

La présente partie de l'IEC 60335 traite de la sécurité des **épurateurs d'air** électriques destinés à un usage domestique et analogue, dont la **tension assignée** est inférieure ou égale à 250 V pour les appareils monophasés et à 480 V pour les autres appareils, y compris les appareils alimentés en courant continu et les **appareils alimentés par batteries**.

Les appareils non destinés à un usage domestique normal, mais qui peuvent néanmoins constituer une source de danger pour le public, tels que les appareils destinés à être utilisés par des usagers non avertis dans des magasins, chez des artisans et dans des fermes, sont compris dans le domaine d'application de la présente norme.

Dans la mesure du possible, la présente norme traite des dangers courants que présentent les appareils et auxquels sont exposés tous les individus situés à l'intérieur et autour de l'habitation. Cependant, elle ne tient en général pas compte

– des personnes (y compris des enfants) dont
  - les capacités physiques, sensorielles ou mentales; ou
  - le manque d'expérience et de connaissance

  les empêchent d'utiliser l'appareil en toute sécurité sans surveillance ou instruction;
– des enfants qui jouent avec l'appareil.

L'attention est attirée sur le fait que

– pour les appareils destinés à être utilisés dans des véhicules ou à bord de navires ou d'avions, des exigences supplémentaires peuvent être nécessaires;
– dans de nombreux pays, des exigences supplémentaires sont spécifiées par les organismes nationaux de la santé, par les organismes nationaux responsables de la protection des travailleurs et par des organismes similaires.

La présente norme ne s'applique pas

– aux **épurateurs d'air** pour lesquels un rayonnement dangereux est intentionnellement émis par l'appareil;
– aux appareils prévus exclusivement pour des usages industriels;
– aux appareils destinés à être utilisés dans des locaux qui présentent des conditions particulières, telles que la présence d'une atmosphère corrosive ou explosive (poussière, vapeur ou gaz);
– aux systèmes d'épuration d'air incorporés dans la structure de bâtiment;
– aux appareils destinés à des usages médicaux (série IEC 60601).