



IEC 60335-2-40

Edition 8.0 2024-12
COMMENTED VERSION

INTERNATIONAL STANDARD



**Household and similar electrical appliances – Safety –
Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and
dehumidifiers**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 23.120

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

FOREWORD

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- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

This commented version (CMV) of the official standard IEC 60335-2-40:2024 edition 8.0 allows the user to identify the changes made to the previous IEC 60335-2-40:2022 edition 7.0. Furthermore, comments from IEC SC 61D 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 60335-2-40 has been prepared by subcommittee 61D: Appliances for air-conditioning for household and similar purposes, of IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This eighth edition cancels and replaces the seventh edition published in 2022. This edition constitutes a technical revision.

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

- a) Clause 12 : Part 1, Clause 12 has been made applicable;
- b) Clause 19: requirement added for **double wall heat exchangers** to be resistant against freezing;
- c) Clause 20: requirement modified for when to apply test probe 18;
- d) Clause 21: requirement added for **double wall heat exchangers** to resistant against the pressure of the refrigerant if one of the walls fails;
- e) Clause 22: requirement modified to reflect that appliances can operate continuously and can be operated remotely without giving rise to a hazard, and requirement added for **double wall heat exchangers** to be constructed to avoid refrigerant leaking into the secondary circuit;
- f) Annex LL has been deleted and replaced by a reference to IEC TS 63542:2024.

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

Draft	Report on voting
61D/538/FDIS	61D/542/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.

A list of all parts of the IEC 60335 series, 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 2-40 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers.

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 associated noun are also in bold.

The following differences of a less permanent nature exist in the countries indicated below:

- 6.1: Class 0I appliances are allowed (Japan).
- 11.8: The temperature of the wooden walls in the test casing is limited to 85 °C (Sweden).

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

- reconfirmed,
- withdrawn, or
- revised.

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

INTRODUCTION

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 instructions. It also covers abnormal situations that can be expected in practice.

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 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **heat pumps, sanitary hot water heat pumps** and **air-conditioners**, incorporating motor-compressors as well as **hydronic fan coils units, dehumidifiers** (with or without motor-compressors), **thermoelectric heat pumps** and **partial units**, their maximum **rated voltage** being not more than 300 V for single phase appliances and 600 V for ~~multi-phase~~ other appliances including direct current (DC) supplied appliances and **battery-operated appliances**. ¹

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

The appliances referenced above can consist of one or more factory-made assemblies. If provided in more than one assembly, the separate assemblies are used together, and the requirements are based on the use of matched assemblies.

NOTE 101 A definition of 'motor-compressor' is given in IEC 60335-2-34, which includes the statement that the term motor-compressor is used to designate either a hermetic motor-compressor or semi-hermetic motor-compressor.

NOTE 102 Requirements for containers intended for storage of the heated water included in **sanitary hot water heat pumps** are, in addition, covered by IEC 60335-2-21.

This standard does not take into account refrigerants other than group A1, A2L, A2 and A3 as defined by ISO 817. **Flammable refrigerants** are limited to those of a molar mass of more than or equal to 42 kg/kmol based on WCF (worst case formulation) as specified in ISO 817.

As far as practical, this standard deals with common hazards presented by appliances that are encountered in normal use and assumes that installation, servicing, decommissioning, and disposal are safely handled by competent persons and accidental release of refrigerants is avoided. However, it does not ~~prescribe~~ specify the criteria to ensure competence of persons during installation, servicing and disposal. Safety requirements during disposal are not specified in this standard.

NOTE 103 Annex HH provides informative requirements on competence of personnel. Criteria for competence of personnel for the purpose of certification schemes can be found in ISO 22712⁴.

Unless specifications are covered by this standard, including the annexes, requirements for refrigerating safety are covered by:

- ISO 5149-1:2014, ISO 5149-1:2014/AMD1:2015, and ISO 5149-1:2014/AMD2:2021,
- ISO 5149-2:2014 and ISO 5149-2:2014/AMD1:2020,
- ISO 5149-3:2014 and ISO 5149-3:2014/AMD1:2021.

⁴ ~~Under preparation. Stage at the time of publication: ISO FDIS 22712:2022~~

Supplementary heaters, or a provision for their separate installation, are within the scope of this standard, but only heaters which are designed as a part of the appliance package, the controls being incorporated in the appliance.

NOTE 104 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, for example, by the national health authorities responsible for the protection of labour and the national authorities responsible for storage, transportation, building constructions and installations.

~~NOTE 105~~—This standard does not apply to

- humidifiers intended for use with heating and cooling equipment (IEC 60335-2-88);
- appliances designed exclusively for industrial processing;
- 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).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IEC 60079-7:2015, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC 60079-7:2015/AMD1:2017

IEC 60079-14:~~2013~~, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60079-15:2017, *Explosive atmospheres – Part 15: Equipment protection by type of protection "n"*

IEC 60335-2-34:2021, *Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor-compressors*

IEC 60335-2-51, *Household and similar electrical appliances – Safety – Part 2-51: Particular requirements for stationary circulation pumps for heating and service water installations*

IEC 60695-1-10, *Fire hazard testing – Part 1-10: Guidance for assessing the fire hazard of electrotechnical products – General guidelines*

IEC 60695-10-2:2014, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60730-2-6, *Automatic electrical controls – Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

IEC TS 63542:2024, *Refrigerant detection systems for flammable refrigerants*

ISO 527-3, *Plastics – Determination of tensile properties – Part 3: Test conditions for films and sheets*

ISO 817, *Refrigerants – Designation and safety classification*

ISO 1302:~~2002~~², *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation*

ISO 2578, *Plastics – Determination of time-temperature limits after prolonged exposure to heat*

ISO 5149-1:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria*
ISO 5149-1:2014/AMD1:2015
ISO 5149-1:2014/AMD2:2021

ISO 5149-2:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation*
ISO 5149-2:2014/AMD1:2020

ISO 5149-3:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site*
ISO 5149-3:2014/AMD1:2021

ISO 5151:~~2017~~, *Non-ducted air conditioners and heat pumps – Testing and rating for performance*
~~ISO 5151:2017/AMD1:2020~~

ISO 7010:2019, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

ISO 13253, *Ducted air-conditioners and air-to-air heat pumps – Testing and rating for performance*

ISO 13256 (all parts), *Water-source heat pumps – Testing and rating for performance*

ISO 13355:~~2016~~, *Packaging – Complete, filled transport packages and unit loads – Vertical random vibration test*

ISO 14903, *Refrigerating systems and heat pumps – Qualification of tightness of components and joints*

ISO 15042, *Multiple split-system air-conditioners and air-to-air heat pumps – Testing and rating for performance*

² Withdrawn.

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Household and similar electrical appliances – Safety –
Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and
dehumidifiers**

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-40: Exigences particulières pour les pompes à chaleur électriques, les
climatiseurs et les déshumidificateurs**

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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.

A list of all parts of the IEC 60335 series, 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 2-40 supplements or modifies the corresponding clauses in IEC 60335-1, so as to convert that publication into the IEC standard: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers.

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 associated noun are also in bold.

The following differences of a less permanent nature exist in the countries indicated below:

- 6.1: Class 0I appliances are allowed (Japan).
- 11.8: The temperature of the wooden walls in the test casing is limited to 85 °C (Sweden).

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

- reconfirmed,
- withdrawn, or
- revised.

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

INTRODUCTION

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 instructions. It also covers abnormal situations that can be expected in practice.

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 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 deals with the safety of electric **heat pumps, sanitary hot water heat pumps** and **air-conditioners**, incorporating motor-compressors as well as **hydronic fan coils units, dehumidifiers** (with or without motor-compressors), **thermoelectric heat pumps** and **partial units**, their maximum **rated voltage** being not more than 300 V for single phase appliances and 600 V for other appliances including direct current (DC) supplied appliances and **battery-operated appliances**.

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

The appliances referenced above can consist of one or more factory-made assemblies. If provided in more than one assembly, the separate assemblies are used together, and the requirements are based on the use of matched assemblies.

NOTE 101 A definition of 'motor-compressor' is given in IEC 60335-2-34, which includes the statement that the term motor-compressor is used to designate either a hermetic motor-compressor or semi-hermetic motor-compressor.

NOTE 102 Requirements for containers intended for storage of the heated water included in **sanitary hot water heat pumps** are, in addition, covered by IEC 60335-2-21.

This standard does not take into account refrigerants other than group A1, A2L, A2 and A3 as defined by ISO 817. **Flammable refrigerants** are limited to those of a molar mass of more than or equal to 42 kg/kmol based on WCF (worst case formulation) as specified in ISO 817.

As far as practical, this standard deals with common hazards presented by appliances that are encountered in normal use and assumes that installation, servicing, decommissioning, and disposal are safely handled by competent persons and accidental release of refrigerants is avoided. However, it does not specify the criteria to ensure competence of persons during installation, servicing and disposal. Safety requirements during disposal are not specified in this standard.

NOTE 103 Annex HH provides informative requirements on competence of personnel. Criteria for competence of personnel for the purpose of certification schemes can be found in ISO 22712.

Unless specifications are covered by this standard, including the annexes, requirements for refrigerating safety are covered by:

- ISO 5149-1:2014, ISO 5149-1:2014/AMD1:2015, and ISO 5149-1:2014/AMD2:2021,
- ISO 5149-2:2014 and ISO 5149-2:2014/AMD1:2020,
- ISO 5149-3:2014 and ISO 5149-3:2014/AMD1:2021.

Supplementary heaters, or a provision for their separate installation, are within the scope of this standard, but only heaters which are designed as a part of the appliance package, the controls being incorporated in the appliance.

NOTE 104 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, for example, by the national health authorities responsible for the protection of labour and the national authorities responsible for storage, transportation, building constructions and installations.

This standard does not apply to

- humidifiers intended for use with heating and cooling equipment (IEC 60335-2-88);
- appliances designed exclusively for industrial processing;
- 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).

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

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

IEC 60079-0, *Explosive atmospheres – Part 0: Equipment – General requirements*

IEC 60079-7:2015, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*
IEC 60079-7:2015/AMD1:2017

IEC 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60079-15:2017, *Explosive atmospheres – Part 15: Equipment protection by type of protection "n"*

IEC 60335-2-34:2021, *Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor-compressors*

IEC 60335-2-51, *Household and similar electrical appliances – Safety – Part 2-51: Particular requirements for stationary circulation pumps for heating and service water installations*

IEC 60695-1-10, *Fire hazard testing – Part 1-10: Guidance for assessing the fire hazard of electrotechnical products – General guidelines*

IEC 60695-10-2:2014, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60730-2-6, *Automatic electrical controls – Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*

IEC 62471:2006, *Photobiological safety of lamps and lamp systems*

IEC TS 63542:2024, *Refrigerant detection systems for flammable refrigerants*

ISO 527-3, *Plastics – Determination of tensile properties – Part 3: Test conditions for films and sheets*

ISO 817, *Refrigerants – Designation and safety classification*

ISO 1302¹, *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation*

ISO 2578, *Plastics – Determination of time-temperature limits after prolonged exposure to heat*

ISO 5149-1:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria*
ISO 5149-1:2014/AMD1:2015
ISO 5149-1:2014/AMD2:2021

ISO 5149-2:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation*
ISO 5149-2:2014/AMD1:2020

ISO 5149-3:2014, *Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site*
ISO 5149-3:2014/AMD1:2021

ISO 5151, *Non-ducted air conditioners and heat pumps – Testing and rating for performance*

ISO 7010:2019, *Graphical symbols – Safety colours and safety signs – Registered safety signs*

ISO 13253, *Ducted air-conditioners and air-to-air heat pumps – Testing and rating for performance*

ISO 13256 (all parts), *Water-source heat pumps – Testing and rating for performance*

ISO 13355, *Packaging – Complete, filled transport packages and unit loads – Vertical random vibration test*

ISO 14903, *Refrigerating systems and heat pumps – Qualification of tightness of components and joints*

ISO 15042, *Multiple split-system air-conditioners and air-to-air heat pumps – Testing and rating for performance*

¹ Withdrawn.

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

**APPAREILS ÉLECTRODOMESTIQUES ET ANALOGUES –
SÉCURITÉ –****Partie 2-40: Exigences particulières pour les pompes
à chaleur électriques, les climatiseurs et les déshumidificateurs**

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.
- 2) Les décisions ou accords officiels de l'IEC concernant les questions techniques représentent, dans la mesure du possible, un accord international sur les sujets étudiés, étant donné que les Comités nationaux de l'IEC intéressés sont représentés dans chaque comité d'études.
- 3) Les Publications de l'IEC se présentent sous la forme de recommandations internationales et sont agréées comme telles par les Comités nationaux de l'IEC. Tous les efforts raisonnables sont entrepris afin que l'IEC s'assure de l'exactitude du contenu technique de ses publications; l'IEC ne peut pas être tenue responsable de l'éventuelle mauvaise utilisation ou interprétation qui en est faite par un quelconque utilisateur final.
- 4) Dans le but d'encourager l'uniformité internationale, les Comités nationaux de l'IEC s'engagent, dans toute la mesure possible, à appliquer de façon transparente les Publications de l'IEC dans leurs publications nationales et régionales. Toutes divergences entre toutes Publications de l'IEC et toutes publications nationales ou régionales correspondantes doivent être indiquées en termes clairs dans ces dernières.
- 5) L'IEC elle-même ne fournit aucune attestation de conformité. Des organismes de certification indépendants fournissent des services d'évaluation de conformité et, dans certains secteurs, accèdent aux marques de conformité de l'IEC. L'IEC n'est responsable d'aucun des services effectués par les organismes de certification indépendants.
- 6) Tous les utilisateurs doivent s'assurer qu'ils sont en possession de la dernière édition de cette publication.
- 7) Aucune responsabilité ne doit être imputée à l'IEC, à ses administrateurs, employés, auxiliaires ou mandataires, y compris ses experts particuliers et les membres de ses comités d'études et des Comités nationaux de l'IEC, pour tout préjudice causé en cas de dommages corporels et matériels, ou de tout autre dommage de quelque nature que ce soit, directe ou indirecte, ou pour supporter les coûts (y compris les frais de justice) et les dépenses découlant de la publication ou de l'utilisation de cette Publication de l'IEC ou de toute autre Publication de l'IEC, ou au crédit qui lui est accordé.
- 8) L'attention est attirée sur les références normatives citées dans cette publication. L'utilisation de publications référencées est obligatoire pour une application correcte de la présente publication.
- 9) L'IEC attire l'attention sur le fait que la mise en application du présent document peut entraîner l'utilisation d'un ou de plusieurs brevets. L'IEC ne prend pas position quant à la preuve, à la validité et à l'applicabilité de tout droit de brevet revendiqué à cet égard. À la date de publication du présent document, l'IEC n'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 60335-2-40 a été établie par le sous-comité 61D: Appareils de conditionnement d'air pour usage domestique et commercial, du comité d'études 61 de l'IEC: Sécurité des appareils électrodomestiques et analogues. Il s'agit d'une Norme internationale.

Cette huitième édition annule et remplace la septième édition parue en 2022. Cette édition constitue une révision technique.

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

- a) Article 0: l'Article 0 de la Partie 1 s'applique désormais;
- b) Article 19: ajout d'une exigence pour la résistance au gel des **échangeurs de chaleur à double paroi**;
- c) Article 20: modification de l'exigence relative à l'application du calibre d'essai 18;
- d) Article 21: ajout d'une exigence pour la résistance des **échangeurs de chaleur à double paroi** à la pression du fluide frigorigène en cas de défaillance de l'une des parois;
- e) Article 22: modification de l'exigence pour tenir compte du fait que les appareils peuvent fonctionner en continu et à distance sans présenter de danger, et ajout d'une exigence précisant que les **échangeurs de chaleur à double paroi** doivent être construits de manière à éviter les fuites de fluide frigorigène dans le circuit secondaire;
- f) l'Annexe LL a été supprimée et remplacée par une référence à l'IEC TS 63542:2024.

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

Projet	Rapport de vote
61D/538/FDIS	61D/542/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.

Une liste de toutes les parties de la série IEC 60335, publiées sous le titre général *Appareils électrodomestiques et analogues – Sécurité*, se trouve sur le site web de l'IEC.

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 2-40 complète ou modifie les articles correspondants de l'IEC 60335-1, de façon à transformer cette publication en norme IEC: Exigences particulières pour les pompes à chaleur électriques, les climatiseurs et les déshumidificateurs.

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 nom associé figurent également en gras.

Les différences suivantes, à caractère moins permanent, existent dans les pays indiqués ci-après:

- 6.1: Les appareils de la classe 0I sont autorisés (Japon).
- 11.8: La température des parois en bois du caisson d'essai est limitée à 85 °C (Suède).

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

- reconduit,
- supprimé, ou
- révisé.

IMPORTANT – Le logo "colour inside" qui se trouve sur la page de couverture de ce document indique qu'il contient des couleurs qui sont considérées comme utiles à une bonne compréhension de son contenu. Les utilisateurs devraient, par conséquent, imprimer ce document en utilisant une imprimante couleur.

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 risques électriques, mécaniques, thermiques, liés au feu et au rayonnement des appareils, lorsqu'ils fonctionnent comme en usage normal en tenant compte des instructions. Elle couvre également les situations anormales qui peuvent être attendues dans la pratique.

Cette 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 d'installation nationales 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.

Cette 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 de l'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 2-40: Exigences particulières pour les pompes à chaleur électriques, les climatiseurs et les déshumidificateurs

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 **pompes à chaleur** électriques, des **pompes à chaleur pour production d'eau chaude sanitaire** et des **climatiseurs**, qui comportent des motocompresseurs ainsi que des **ventiloconvecteurs hydroniques**, des **déshumidificateurs** (avec ou sans motocompresseur), des **pompes à chaleur thermoélectriques** et des **unités partielles**. Leur **tension assignée** maximale n'est pas supérieure à 300 V pour les appareils monophasés et à 600 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.

Les appareils indiqués ci-dessus peuvent consister en un ou plusieurs ensembles fabriqués en usine. Lorsque les appareils sont fournis en plusieurs ensembles, les ensembles sont utilisés conjointement et les exigences correspondantes dépendent de l'utilisation des ensembles assortis.

NOTE 101 Une définition du terme "motocompresseur" est donnée dans l'IEC 60335-2-34 qui indique que le terme "motocompresseur" est utilisé pour désigner un motocompresseur hermétique ou semi-hermétique.

NOTE 102 En outre, l'IEC 60335-2-21 spécifie les exigences relatives aux cuves destinées au stockage de l'eau chauffée dans les **pompes à chaleur pour production d'eau chaude sanitaire**.

La présente norme ne couvre pas les fluides frigorigènes qui n'appartiennent pas aux groupes A1, A2L, A2 et A3 qui sont définis dans l'ISO 817. Les **fluides frigorigènes inflammables** se limitent à ceux dont la masse molaire est supérieure ou égale à 42 kg/kmol d'après la formule "la plus défavorable" (WCF, *Worst Case Formulation*) spécifiée dans l'ISO 817.

Dans la mesure du possible, la présente norme traite des dangers courants engendrés par les appareils qui sont rencontrés dans le cadre d'une utilisation normale et elle prend pour hypothèse que l'installation, l'entretien, la mise hors service et la mise au rebut sont effectués en toute sécurité par des personnes compétentes et que le dégagement accidentel de fluides frigorigènes est évité. Toutefois, elle ne spécifie pas les critères qui permettent d'assurer la compétence des personnes lors de l'installation, de l'entretien et de la mise au rebut. Les exigences de sécurité pendant la mise au rebut ne sont pas spécifiées dans la présente norme.

NOTE 103 L'Annexe HH fournit des exigences informatives relatives à la compétence du personnel. Les critères de compétence du personnel aux fins des systèmes de certification figurent dans l'ISO 22712.

Sauf spécification contraire dans la présente norme et ses annexes, les exigences relatives à la sécurité des systèmes frigorifiques sont spécifiées dans:

– l'ISO 5149-1:2014, l'ISO 5149-1:2014/AMD1:2015 et l'ISO 5149-1:2014/AMD2:2021;

- l'ISO 5149-2:2014 et l'ISO 5149-2:2014/AMD1:2020;
- l'ISO 5149-3:2014 et l'ISO 5149-3:2014/AMD1:2021.

Les **dispositifs de chauffage supplémentaires** (ou les dispositions concernant leur installation) sont couverts par le domaine d'application de la présente norme, mais uniquement les dispositifs de chauffage qui sont conçus en tant que partie de l'appareil, les commandes étant incorporées à l'appareil.

NOTE 104 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 exemple par les organismes nationaux de la santé publique responsables de la protection des travailleurs et par les organismes nationaux responsables du stockage, du transport, de la construction des bâtiments et des installations.

La présente norme ne s'applique pas

- aux humidificateurs destinés à être utilisés avec des appareils de chauffage et de refroidissement (IEC 60335-2-88);
- 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).

2 Références normatives

L'article de la Partie 1 s'applique, avec l'exception suivante.

Addition:

IEC 60068-2-52, *Essais d'environnement – Partie 2-52: Essais – Essai Kb: Brouillard salin, essai cyclique (solution de chlorure de sodium)*

IEC 60079-0, *Atmosphères explosives – Partie 0: Matériel – Exigences générales*

IEC 60079-7:2015, *Atmosphères explosives – Partie 7: Protection du matériel par sécurité augmentée "e"*
IEC 60079-7:2015/AMD1:2017

IEC 60079-14, *Atmosphères explosives – Partie 14: Conception, sélection et construction des installations électriques*

IEC 60079-15:2017, *Atmosphères explosives – Partie 15: Protection du matériel par mode de protection "n"*

IEC 60335-2-34:2021, *Appareils électrodomestiques et analogues – Sécurité – Partie 2-34: Exigences particulières pour les motocompresseurs*

IEC 60335-2-51, *Appareils électrodomestiques et analogues – Sécurité – Partie 2-51: Exigences particulières pour les pompes de circulation fixes pour installations de chauffage et de distribution d'eau*

IEC 60695-1-10, *Essais relatifs aux risques du feu – Partie 1-10: Lignes directrices pour l'évaluation des risques du feu des produits électrotechniques – Lignes directrices générales*

IEC 60695-10-2:2014, *Essais relatifs aux risques du feu – Partie 10-2: Chaleurs anormales – Essai à la bille*

IEC 60730-2-6, *Dispositifs de commande électrique automatiques – Partie 2-6: Exigences particulières pour les dispositifs de commande électrique automatiques sensibles à la pression y compris les exigences mécaniques*

IEC 62471:2006, *Sécurité photobiologique des lampes et des appareils utilisant des lampes*

IEC TS 63542:2024, *Refrigerant detection systems for flammable refrigerants* (disponible en anglais seulement)

ISO 527-3, *Plastiques – Détermination des propriétés en traction – Partie 3: Conditions d'essai pour films et feuilles*

ISO 817, *Refrigerants – Designation and safety classification* (disponible en anglais seulement)

ISO 1302¹, *Spécification géométrique des produits (GPS) – Indication des états de surface dans la documentation technique de produits*

ISO 2578, *Plastiques – Détermination des limites temps-températures après exposition à l'action prolongée de la chaleur*

ISO 5149-1:2014, *Systèmes frigorifiques et pompes à chaleur – Exigences de sécurité et d'environnement – Partie 1: Définitions, classification et critères de choix*
ISO 5149-1:2014/AMD1:2015
ISO 5149-1:2014/AMD2:2021

ISO 5149-2:2014, *Systèmes frigorifiques et pompes à chaleur – Exigences de sécurité et d'environnement – Partie 2: Conception, construction, essais, marquage et documentation*
ISO 5149-2:2014/AMD1:2020

ISO 5149-3:2014, *Systèmes frigorifiques et pompes à chaleur – Exigences de sécurité et d'environnement – Partie 3: Site d'installation*
ISO 5149-3:2014/AMD1:2021

ISO 5151, *Non-ducted air conditioners and heat pumps – Testing and rating for performance* (disponible en anglais seulement)

ISO 7010:2019, *Symboles graphiques – Couleurs de sécurité et signaux de sécurité – Signaux de sécurité enregistrés*

ISO 13253, *Ducted air-conditioners and air-to-air heat pumps – Testing and rating for performance* (disponible en anglais seulement)

ISO 13256 (toutes les parties), *Pompes à chaleur à eau – Essais et détermination des caractéristiques de performance*

ISO 13355, *Emballages – Emballages d'expédition complets et pleins et charges unitaires – Essais de vibration verticale aléatoire*

ISO 14903, *Systèmes de réfrigération et pompes à chaleur – Qualification de l'étanchéité des composants et des joints*

ISO 15042, *Climatiseurs et pompes à chaleur air/air multi-split – Essais et détermination des caractéristiques de performance*

¹ Supprimée.