SLOVENSKI STANDARD
SIST EN IEC 60335-2-40:2023

01-julij-2023

Nadomešča:
SIST EN 60335-2-40:2003
SIST EN 60335-2-40:2003/A2:2009

Gospodinjski in podobni električni aparati - Varnost - 2-40. del: Posebne zahteve za električne toplotne črpalke, klimatske naprave in sušilnike zraka (IEC 60335-2-40:2018)

Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers (IEC 60335-2-40:2018)

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-40: Besondere Anforderungen für elektrisch betriebene Wärmepumpen, Klimageräte und Raumluft-Entfeuchter (IEC 60335-2-40:2018)

Appareils électrodomestiques et analogues - Sécurité - Partie 2-40: Exigences particulières pour les pompes à chaleur électriques, les climatiseurs et les déshumidificateurs (IEC 60335-2-40:2018)

Ta slovenski standard je istoveten z: **EN IEC 60335-2-40:2023**

ICS:

23.120	Zračniki. Vetrniki. Klimatske naprave	Ventilators. Fans. Air-conditioners
27.080	Toplotne črpalke	Heat pumps

SIST EN IEC 60335-2-40:2023 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 60335-2-40

May 2023

ICS 23.120

Supersedes EN 60335-2-40:2003; EN 60335-2-40:2003/A11:2004; EN 60335-2-40:2003/A12:2005; EN 60335-2-40:2003/corrigendum Apr. 2006; EN 60335-2-40:2003/A1:2006; EN 60335-2-40:2003/A2:2009; EN 60335-2-40:2003/corrigendum Aug. 2010; EN 60335-2-40:2003/A13:2012; EN 60335-2-40:2003/A13:2012/AC:2013

English Version

Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electrical heat pumps, air-conditioners and dehumidifiers (IEC 60335-2-40:2018)

Appareils électrodomestiques et analogues - Sécurité - Partie 2-40: Exigences particulières pour les pompes à chaleur électriques, les climatiseurs et les déshumidificateurs (IEC 60335-2-40:2018)

Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke - Teil 2-40: Besondere Anforderungen für elektrisch betriebene Wärmepumpen, Klimageräte und Raumluft-Entfeuchter (IEC 60335-2-40:2018)

This European Standard was approved by CENELEC on 2023-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 60335-2-40:2023 E

European foreword

This document (EN IEC 60335-2-40:2023) consists of the text of IEC 60335-2-40:2018, prepared by IEC/TC 61 "Safety of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2024-03-01
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2026-03-01

This document supersedes EN 60335-2-40:2003 and all of its amendments and corrigenda (if any).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document is read in conjunction with EN IEC 60335-2-40:2023/A11:2023.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60335-2-40:2018 was approved by CENELEC as a European Standard without any modification.

IEC 60335-2-40

Edition 6.0 2018-01

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

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

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 23.120

ISBN 978-2-8322-7980-9

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

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

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard 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.

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

FDIS	Report on voting
61D/386/FDIS	61D/391/RVD

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

This sixth edition cancels and replaces the fifth edition published in 2013 and its Amendment 1:2016. This edition constitutes a technical revision.

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

– Clause 1 – limiting A2L refrigerants to those of a molar mass of more than or equal to 42 kg/kmol;
– Clause 7 – added requirements for A2L refrigerants,
– Clause 7 – added requirement for pre-charge pipe sets, detection systems, ventilation and the resulting charge;
– Clause 7 – added requirements for UV-C systems;
– Clause 7 – added requirements for transcritical refrigerating systems;
– Subclause 19.7 – amended text to match the intention of the subclause;
– Clause 21 – added requirements for transcritical refrigerating systems;
– Subclause 22 – added requirements for A2L refrigerants;
– Subclause 22– added detection systems;
– Subclause 22 – added new requirements for enhanced tightness refrigerating systems;
– Subclause 22 – added new requirements for UV-C;
– Clause 23 – added new requirements for UV-C;Clause
– Clause 24 – added requirements for transcritical refrigerating systems;
– Subclause 24 – added requirements for detection systems and airflow;
– Clause 32 added new requirements for UV-C;
– Annex BB – revised to add surface temperatures;
– Annex DD – added requirements for A2L refrigerants and amended requirements for flammable refrigerants to exempt A2L refrigerants;
– Annex GG – added requirements for A2L refrigerants;
– Annex GG.1 – amended Table GG.1 and related wording
– Annex GG.7 – added requirement to test;
– Annex GG.8 to GG.13 – new coverage for A2L refrigerants;
– Annex HH – revised to take into account A2L refrigerants;
– Annex JJ – new coverage of allowable opening of relays and similar components to prevent ignition of A2L refrigerants;
– Annex KK – new coverage of test method for hot surface ignition temperature for A2L;
– Annex LL – new coverage of refrigerant detection systems for A2L Refrigerants;
– Annex MM – new coverage of refrigerant sensor location confirmation test;
– Annex NN – new coverage of flame arrest enclosure verification test for A2L refrigerants;
– Annex OO – new coverage of UV radiation conditioning
– Bibliography – added new references.

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

This part 2-40 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of IEC 60335-1:2010, its Amendment 1:2013 and its Amendment 2:2016.

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: Safety 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 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).

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.

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication 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.

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 may differ.

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

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

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

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

NOTE 2 Horizontal and generic standards 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.

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.

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**, including **sanitary hot water heat pumps**, **air conditioners**, and **dehumidifiers** incorporating motor-compressors and **hydronic fan coils units**, their maximum **rated voltages** being not more than 250 V for single phase appliances and 600 V for all other appliances. **Partial units** are within the scope of this International Standard.

Appliances not intended for normal household use but which nevertheless may 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.

The appliances referenced above may consist of one or more factory-made assemblies. If provided in more than one assembly, the separate assemblies are to be 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 refrigerating safety are covered by ISO 5149-1, ISO 5149-2, and ISO 5149-3. 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 classification, **A2L 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.

This standard specifies particular requirements for the use of **flammable refrigerants**. Unless specifications are covered by this standard, including the annexes, requirements for refrigerating safety are covered by ISO 5149.

The parts of ISO 5149 of particular concern to this standard are as follows:

- ISO 5149-1:2014, Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria.
- ISO 5149-2, Refrigerating systems and heat pumps – Safety and environmental requirements – Part 2: Design, construction, testing, marking and documentation;
- ISO 5149-3:2014, Refrigerating systems and heat pumps – Safety and environmental requirements – Part 3: Installation site.

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 103 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- for appliances subjected to pressure, additional requirements may 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 104 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 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

IEC 60079-15:2010, *Explosive atmospheres – Part 15: Equipment protection by type of protection "n"*

IEC 60335-2-34:2012, *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 60730-2-6, *Automatic electrical controls – Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*

IEC 61032, *Protection of persons and equipment by enclosures – Probes for verification*

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

ISO 817, *Refrigerants – Designation and safety classification*

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

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

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

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

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

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

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

ISO 7010:2011, *Graphic 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 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*

ASTM D4728-06:2012, *Standard Test Method for Random Vibration Testing of Shipping Containers*

CAN/CSA-C22.2 No. 0.17, *Evaluation of Properties of Polymeric Materials*

UL 746A, *Standard for Polymeric Materials – Short Term Property Evaluations*

UL 746B, *Standard for Polymeric Materials – Long Term Property Evaluations*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1.4 *Addition:*

Note 101 to entry: If the appliance comprises electrical accessories, including fans, the **rated power input** is based upon the total maximum **electrical power input** with all accessories energized, when operating continuously under the appropriate environmental conditions. If the **heat pump** can be operated in the heating or cooling mode, the **rated power input** is based upon the input in the heating or in the cooling mode, whichever is the greater.

3.1.9 *Replacement:*

normal operation
conditions that apply when the appliance is mounted as in normal use and is operating under the most severe operating conditions specified by the manufacturer

3.101
heat pump
appliance which takes up heat at a certain temperature and releases heat at a higher temperature

Note 1 to entry: When operated to provide heat (e.g., for space heating or water heating), the appliance is said to operate in the heating mode; when operated to remove heat (for example, for space cooling), it is said to operate in the cooling mode.

Note 2 to entry: A **heat pump** can contain a combination of **condensing unit or condenser unit** and an **evaporating unit** or **evaporator unit** and can be equipped to operate in a reverse cycle mode.

3.102
sanitary hot water heat pump
heat pump intended to transfer heat to water suitable for human consumption

3.103
air conditioner
encased assembly or assemblies designed as an appliance to provide delivery of conditioned air to an enclosed space, room or zone

Note 1 to entry: It includes an electrically operated **refrigerating system** for cooling and possibly dehumidifying the air.

Note 2 to entry: It may have means for heating, circulating, cleaning and humidifying the air.

Note 3 to entry: An **air conditioner** can contain a combination of **condensing unit** or **condenser unit** and an **evaporating unit** or **evaporator unit**.

3.104
dehumidifier
encased assembly designed to remove moisture from its surrounding atmosphere

Note 1 to entry: It includes an electrically operated **refrigerating system** and the means to circulate air. It also includes a drain arrangement for collecting and storing and/or disposing of the condensate.

3.108
wet-bulb temperature
WB
temperature indicated when the temperature-sensitive element in a wetted wick has reached a state of constant temperature (evaporative equilibrium)

3.109
dry-bulb temperature
DB
temperature indicated by a dry, temperature-sensitive element shielded from the effects of radiation

3.110
evaporator
heat exchanger in which refrigerant liquid is vaporized by absorption of heat

3.111
heat exchanger
device specifically designed to transfer heat between two physically separated fluids

3.112
indoor heat exchanger
heat exchanger designed to transfer heat to the indoor parts of the building or to the indoor hot water supplies (e.g. sanitary water) or to remove heat therefrom

3.113
outdoor heat exchanger
heat exchanger designed to remove or release heat from the heat source (for example, ground water, outdoor air, exhaust air, water or brine)

3.114
supplementary heater
electric heater provided as part of the appliance to supplement or replace the output of the refrigerant circuit of the appliance by operation in conjunction with, or instead of, the refrigerating circuit