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Edition 7.2 2016-04
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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Household and similar electrical appliances – Safety – Part 2-7: Particular requirements for washing machines

Appareils électrodomestiques et analogues – Sécurité – Partie 2-7: Règles particulières pour les machines à laver le linge

IEC 60335-2-7:2008-06+AMD1:2011-12+AMD2:2016-04 CSV(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

FOREWORD

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This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 60335-2-40 edition 5.1 contains the fifth edition (2013-12) [documents 61D/213/FDIS and 61D/220/RVD] and its amendment 1 (2016-04) [documents 61D/333/FDIS and 61D/334/RVD].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

International Standard IEC 60335 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 principal changes in this edition as compared with the fourth edition are as follows (minor changes are not listed):

– 3.127 and 3.128 – added new definitions;
– 5.10 – length of refrigerant lines now specified for testing;
– 7.1 – changed marking requirements for **flammable refrigerants**;
– 8.15 – added requirement to clarify the placement of installation panels during testing;
– 11.2.1 – clarification of test procedure;
– 19 – (whole clause) – replaced in its entirety;
– 21.2 – added new coverage for vibration considerations during transport;
– 22.46 – added clarification for PEC;
– 22.118 – added coverage for use of mechanical connectors indoors when employing **flammable refrigerants**;
– 32 – made this section of Part 1 applicable;
– Annex FF2.4 – revised calculation for calculating volume (V);
– Annex FF2.5 – revision of allowable concentration of flammable refrigerant gas;
– Annex GG8 – new coverage added;
– Annex HH – added informative annex.

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

This part 2 is to be used in conjunction with the latest edition of IEC 60335-1 and its amendments. It was established on the basis of the fifth edition (2010) 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: 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 the base publication and its amendment will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

A bilingual version of this publication may be issued at a later date.

NOTE The attention of the National Committees is drawn to the fact that the amendment is intended to make the information available before a full revision of IEC 60335-2-40 will be launched.

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 manufacturer's 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** ~~room~~ **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.

This standard also applies to electric **heat pumps**, **air conditioners** and **dehumidifiers** containing **flammable refrigerant**. **Flammable refrigerants** are defined in 3.121.

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 refrigeration safety are covered by ISO 5149, and 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 ~~chemicals~~ refrigerants other than ~~group~~ those classified as A1, A2L, A2 or A3 ~~as defined by~~ under ISO 817 or ANSI/ASHRAE 34 ~~[ISO 817] classification~~.

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 sections and clauses in ISO 5149 of particular concern to this standard are as follows:

– Section 3: "Design and construction of equipment" applies to all appliances and systems.
– Section 4: "Requirements for utilization" applies to appliances and systems which are for "similar electrical appliances", i.e. commercial and light industrial.
– Section 5: "Operating procedures" applies to appliances and systems which are for "similar electrical appliances", i.e. commercial and light industrial.

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*

ISO 817:2005, *Refrigerants – Designation system*

ISO 5149:1993, *Mechanical refrigerating systems used for cooling and heating – Safety requirements*

ISO 7010: 2011, *Graphic Symbols – Safety colours and safety signs – Registered safety signs*

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

ANSI/ASHRAE 34:2010, *Designation and safety classification of refrigerants*

ASTM D4728-01:2001, *Standard Test Method for Random Vibration Testing of Shipping Containers*

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 refrigeration 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 refrigeration system and the means to circulate air. It also includes a drain arrangement for collecting and storing and/or disposing of the condensate.

3.105

dehumidification – comfort

dehumidification to reduce the humidity within a space to a level to satisfy the requirements of the occupants

3.106

dehumidification – process

dehumidification to reduce the humidity within a space to a level necessary for the process or the storage of goods and/or materials or the drying out of the building fabric