

CONSOLIDATED VERSION



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



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

INTERNATIONAL
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CONTENTS

FOREWORD.....	5
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	10
3 Terms and definitions	11
4 General requirement.....	15
5 General conditions for the tests.....	15
6 Classification.....	16
7 Marking and instructions	16
8 Protection against access to live parts	20
9 Starting of motor-operated appliances.....	20
10 Power input and current.....	20
11 Heating	20
12 Void	26
13 Leakage current and electric strength at operating temperature	26
14 Transient overvoltages	27
15 Moisture resistance	27
16 Leakage current and electric strength.....	28
17 Overload protection of transformers and associated circuits.....	28
18 Endurance.....	28
19 Abnormal operation	28
20 Stability and mechanical hazards	33
21 Mechanical strength.....	33
22 Construction.....	34
23 Internal wiring.....	38
24 Components	38
25 Supply connection and external flexible cords	39
26 Terminals for external conductors	39
27 Provision for earthing.....	39
28 Screws and connections	40
29 Clearances, creepage distances and solid insulation	40
30 Resistance to heat and fire	40
31 Resistance to rusting	40
32 Radiation, toxicity and similar hazards	41
Annexes	44
Annex D (normative) Thermal motor protectors.....	44
Annex I (normative) Motors having basic insulation that is inadequate for the rated voltage of the appliance	44
Annex AA (informative) Examples for operating temperatures of the appliance.....	45
Annex BB (normative) Selected information about refrigerants.....	47

Annex CC (informative) Transportation, marking and storage for units that employ flammable refrigerants	49
CC.1 Transport of equipment containing flammable refrigerants	49
CC.2 Marking of equipment using signs	49
CC.3 Disposal of equipment using flammable refrigerants	49
CC.4 Storage of equipment/appliances	49
CC.5 Storage of packed (unsold) equipment	49
Annex DD (normative) Instruction manual for servicing refrigerant containing appliances	50
DD.1 Symbols	50
DD.2 Information in manual	50
DD.2.1 General	50
DD.2.2 Unventilated areas	51
DD.2.3 Qualification of workers	51
DD.3 Information on servicing	51
DD.3.1 Checks to the area	51
DD.3.2 Work procedure	51
DD.3.3 General work area	51
DD.3.4 Checking for presence of refrigerant	52
DD.3.5 Presence of fire extinguisher	52
DD.3.6 No ignition sources	52
DD.3.7 Ventilated area	52
DD.3.8 Checks to the refrigeration equipment	52
DD.3.9 Checks to electrical devices	52
DD.4 Repairs to sealed components	53
DD.5 Repair to intrinsically safe components	53
DD.6 Cabling	53
DD.7 Detection of flammable refrigerants	54
DD.8 Leak detection methods	54
DD.9 Removal and evacuation	54
DD.10 Charging procedures	55
DD.11 Decommissioning	55
DD.12 Labelling	56
DD.13 Recovery	56
Annex EE (normative) Pressure tests	57
EE.1 General	57
EE.2 Pressure test value determined under testing carried out in Clause 11	57
EE.3 Pressure test value determined under testing carried out in Clause 19	57
EE.4 Pressure test value determined under testing carried out under standstill conditions	57
EE.5 Fatigue test option for Clauses EE.1 and EE.4.1	58
Annex FF (normative) Leak simulation tests	60
FF.1 General	60
FF.2 Test methods	60
Annex GG (normative) Charge limits, ventilation requirements and requirements for secondary circuits	62
GG.1 General	62
GG.2 Requirements for charge limits in unventilated areas	63

GG.3	Requirements for charge limits in areas with mechanical ventilation	64
GG.4	Requirements for mechanical ventilation within the appliance enclosure	65
GG.5	Requirements for mechanical ventilation for rooms complying with ISO 5149	66
GG.6	Requirements for refrigeration systems employing secondary heat exchangers	66
GG.7	Additional testing	67
GG.8	Non fixed factory sealed single package units with a refrigerant charge amount of $m_1 < \cancel{M} m_C \leq 2 \times m_1$	67
Annex HH (informative)	Competence of service personnel	74
HH.1	General	74
HH.2	Training	74
Bibliography	77
Figure 101a	– Upflow application	41
Figure 101b	– Downflow application	42
Figure 101	– Arrangement for heating test of appliances with supplementary heater	42
Figure 102	– Supply circuit for locked-rotor test of a motor of the single-phase type – Revise as needed for three-phase test	43
Figure GG.1	– Unventilated area	71
Figure GG.2	– Mechanical ventilation	71
Figure GG.3	– Isosceles triangle arrow test gauge	72
Figure GG.4	– Measurement of vibration amplitude	72
Figure GG.5	– Relevant heights h_{inst} , h_0 and h_{rel} for calculation of A_{min} and m_{max}	73
Table 3	– Temperature limits (1 of 3)	24
Table BB.1	– Selected information about refrigerants	47
Table GG.1	– Mass of refrigerants	63
Table GG.2	– Appliance with packaging	68
Table GG.3	– Appliance without packaging	69
Table GG.4	– Maximum refrigerant charge (m_{max}) (kg) (see Note 2 of Clause GG.2)	70
Table GG.5	– Minimum room area (m^2) (see Note 2 of Clause GG.2)	70

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.
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This Consolidated version is not an official IEC Standard and has been prepared for user convenience. Only the current versions of the standard and its amendment(s) are to be considered the official documents.

This Consolidated version of IEC 60335-2-40 bears the edition number 5.1. It consists of 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]. The technical content is identical to the base edition and its amendment.

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.