

INTERNATIONAL STANDARD

IEC 60335-2-40

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AMENDMENT 1
2005-03

Amendment 1

**Household and similar electrical appliances –
Safety –**

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

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FOREWORD

This amendment 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 amendment is based on the following documents:

FDIS	Report on voting
61D/138/FDIS	61D/140/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result 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- withdrawn,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.

The contents of the corrigendum of May 2006 have been included in this copy.

CONTENTS

Add the titles of new Annexes BB to GG as follows:

- Annex BB (normative) Select information about refrigerants
- Annex CC (informative) Transportation, marking and storage for units that employ flammable refrigerants
- Annex DD (normative) Service operations
- Annex EE (normative) Pressure tests
- Annex FF (normative) Leak simulation tests
- Annex GG (normative) Charge limits, ventilation requirements and requirements for secondary circuits

1 Scope

Delete the word "sealed" from the first paragraph.

Add, after the second paragraph, the following new paragraph:

This standard also applies to electric **heat pumps, air conditioners** and **dehumidifiers** containing **flammable refrigerant**. **Flammable refrigerants** are defined in 3.120.

Replace the existing Note 101 by the following:

NOTE 101 A definition of 'motor-compressor' is given in IEC60335-2-34, which includes the statement that the term motor-compressor is to be used to designate either a hermetic motor-compressor or semi-hermetic motor-compressor.

Add, after Note 102, the following new paragraph:

This standard does not take into account chemicals other than group A1, A2, or A3 as defined by 3.121.

Replace the existing Note 103 by the following:

NOTE 103 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.

Replace, in Note 4, the last dashed item by the following:

- 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.

2 Normative references

The clause of Part 1 is applicable except as follows.

Add to the existing list the titles of the following standards:

IEC 60079-14, *Electrical apparatus for explosive gas atmospheres – Part 14: Electrical installations in hazardous areas (other than mines)*

IEC 60079-15:2001, *Electrical apparatus for explosive atmospheres – Part 15: Type of protection "n"*

ISO 817:1974, *Organic refrigerants – number designation*

ISO 3864:1984, *Safety colours and safety signs*¹⁾

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

ISO 7000: *Graphical symbols for use on equipment – Index synopsis*

ANSI/ASHRAE 34:2001, *Designation and safety classification of refrigerants*

¹⁾ ISO 3864:1984 has been replaced by ISO 3864-1 2002, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and public areas* and ISO 7010:2003, *Graphical symbols – Safety colours and safety signs -- Safety signs used in workplaces and public areas*. However the safety sign referred to here in ISO 3864 (symbol B.3.2, Caution, risk of fire) is no longer contained in either ISO 3864-1 or ISO 7010.

3 Definitions

Add the following new definitions:

3.121

flammable refrigerant

refrigerant with a classification of class A2 or A3 in compliance with ANSI/ASHRAE 34-2001 [ISO817] classification.

3.122

refrigerating system

combination of interconnected refrigerant containing parts constituting one closed refrigerant circuit in which refrigerant is circulated for the purpose of extracting heat at the low temperature side to reject heat at the high temperature side by changing the state of the refrigerant

3.123

maximum allowable pressure

a limit to the refrigerating system operating pressure, generally the maximum pressure for which the equipment is designed, as specified by the manufacturer

NOTE Maximum allowable pressure constitutes a limit to the operating pressure whether the equipment is working or not, see Clause 21.

3.124

low-pressure side

the part(s) of a refrigerating system operating at the evaporator pressure

3.125

high-pressure side

the part(s) of a refrigerating system operating at the condenser pressure

3.126

service port

a means to access the refrigerant in a refrigerating system for the purpose of charging or servicing the system, typically a valve, tube extension or entry location

5 General conditions for the tests

Add the following subclause:

5.2 Addition:

The testing of Clause 21 may be carried out on separate samples. The testing of Clauses 11, 19 and 21 shall require that pressure measurements be made at various points in the refrigerating system

At least one additional specially prepared sample is required for the tests of Annex FF (Leak simulation tests), if that test option is selected.

The temperatures on the refrigerant piping should be measured during the test of Clause 11.

NOTE Due to the potentially hazardous nature of the tests of Clause 21 and Annexes EE and FF, special precautions need to be taken when carrying out the tests.

5.102 *Motor compressors that are tested and comply with IEC 60335-2-34 need not be additionally tested for Clause 21.*

7 Marking and instructions

7.1 Modification:

Add the following paragraphs to the existing addition:

The flame symbol and the instruction manual symbol of 7.6 shall be visible when a **flammable refrigerant** is employed and the following conditions exist:

- accessing parts expected to be subjected to maintenance or repair;
- observing the appliance under sale or installed conditions;
- observing the appliance packaging, if the appliance is charged with refrigerant.

If a flammable refrigerant is used, the symbols for “read operator’s manual”, “operator’s manual; operating instructions” and “service indicator; read technical manual” (symbols 0790, 1641 and 1659 of ISO 7000) shall be placed on the appliance in a location visible to the persons required to know the information. The perpendicular height shall be at least 10 mm.

An additional warning symbol (flame symbol: B.3.2 of ISO 3864) shall be placed on the nameplate of the unit near the declaration of the refrigerant type and charge information. The perpendicular height shall be at least 10 mm, and the symbol need not be in colour.

NOTE 101 When installed, the marking should be visible after removing a **detachable** part.

The following warning shall also be applied to the appliance when a **flammable refrigerant** is employed.

WARNING

Appliance shall be installed, operated and stored in a room with a floor area larger than 'X' m² (only applies to **appliances** that are not **fixed appliances**).

For **appliances**, which are not **fixed appliances**, the minimum room size X shall be specified on the appliance. The X in the marking shall be determined in m² by the procedure described in paragraph 2 of Annex GG for unventilated areas and the X in the marking shall be 4 if the refrigerant charge of the appliance is less than m₁ (see Annex GG, paragraph 1.1).

The maximum allowable pressure for the low-pressure side and the high-pressure side shall be marked on the product.

NOTE 102 For the **refrigerating system**; if the **maximum allowable pressure** of the **low-pressure side** and the **high-pressure side** is the same, a single indication is permitted.

If not already visible when accessing a **service port** and if a **service port** is provided, the **service port** shall be marked to identify the type of refrigerant. If the refrigerant is flammable, symbol B.3.2 of ISO 3864, shall be included, without specifying the colour.

Add the following subclause:

7.6 Addition:

When a **flammable refrigerant** is employed, a warning symbol B.3.2 of ISO 3864, including colour and format, shall be permanently placed on the appliance. The perpendicular height of the triangle containing the "Caution, risk of fire" symbol shall be at least 30 mm.

When a **flammable refrigerant** is employed, a symbol requiring reference to the manual [0790 of ISO 7000], including colour and format, shall be permanently placed on the appliance.