

Household and similar electrical appliances — Safety —

**Part 2-89: Particular requirements for
commercial refrigerating appliances
with an incorporated or remote
refrigerant condensing unit or
compressor**

ICS 97.130.20

National foreword

This British Standard is the UK implementation of EN 60335-2-89:2002, incorporating amendments A11:2004, A1:2005, A2:2007 and corrigendum August 2010. It is derived from IEC 60335-2-89:2002, incorporating amendments 1:2005 and 2:2007.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by **A1** **A1**.

The UK participation in its preparation was entrusted by Technical Committee CPL/61, Safety of household and similar electrical appliances, to Subcommittee CPL/61/3, Refrigerators and food freezers.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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EUROPEAN STANDARD

EN 60335-2-89+A2

March 2007

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Incorporating corrigendum August 2010

English version

Household and similar electrical appliances - Safety

Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor (IEC 60335-2-89:2002)

Appareils électrodomestiques et
analogues - Sécurité
Partie 2-89: Règles particulières
pour les appareils de réfrigération
à usage commercial avec une unité
de condensation du fluide frigorigène
ou un compresseur incorporés ou à distance
(CEI 60335-2-89:2002)

Sicherheit elektrischer Geräte für den
Hausgebrauch und ähnliche Zwecke
Teil 2-89: Besondere Anforderungen
für gewerbliche Kühl-/Gefriergeräte
mit eingebautem oder getrenntem
Verflüssigersatz oder Motorverdichter
(IEC 60335-2-89:2002)

This European Standard was approved by CENELEC on 2002-09-24. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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CENELEC

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

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Foreword

The text of document 61C/208/FDIS, future first edition of IEC 60335-2-89, prepared by SC 61C of the IEC Technical Committee 61, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60335-2-89 on 2002-09-24.

The following dates are applicable:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2003-07-01
- date on which national standards
conflicting with the EN have to be withdrawn (dow) 2005-10-01

This part 2 has to be used in conjunction with EN 60335-1, Household and similar electrical appliances – Safety – Part 1: General requirements. It was established on the basis of the 2002 edition of that standard. Amendments and revisions of Part 1 have also to be taken into account and the dates when such changes become applicable will be stated in the relevant amendment or revision of Part 1.

This part 2 supplements or modifies the corresponding clauses of EN 60335-1, so as to convert it into the European Standard: Safety requirements for commercial electric refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor.

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 of Part 1 is to be adapted accordingly.

NOTE 1 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.;
- subclauses, notes and annexes that are additional to those in the IEC standard are prefixed with the letter Z.

NOTE 2 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 the associated noun are also in bold.

There are no special national conditions causing a deviation from this European Standard, other than those listed in Annex ZA to EN 60335-1.

There are no national deviations from this European Standard, other than those listed in Annex ZB to EN 60335-1.

Annex AA is normative and forms an integral part of this standard.

Introduction

An investigation by CENELEC TC 61 has shown that all risks from products within the scope of this standard are fully covered by the Low Voltage Directive, 73/23/EEC. For products having mechanical moving parts, a risk assessment in accordance with the Machinery Directive, 98/37/EC, has shown that the risks are mainly of electrical origin and consequently this directive is not applicable. However, the relevant essential safety requirements of the Machinery Directive are covered by this standard together with the principal objectives of the Low Voltage Directive.

Products within the scope of this standard may incorporate pressurized components for which the Pressure Equipment Directive, 97/23/EC, applies. Further guidance is given in Annex ZAA.

Endorsement notice

The text of the International Standard IEC 60335-2-89:2002 was approved by CENELEC as a European Standard without any modification.

Foreword to amendment A11

A proposal to amend EN 60335-2-89, document CLC/TC 61(SEC)1397, was discussed during the Brussels meeting of CENELEC TC 61 in November 2002, when it was decided to submit a draft for an amendment to the Unique Acceptance Procedure.

The draft was circulated in June 2003 and was approved by CENELEC as amendment A11 to EN 60335-2-89:2002 on 2004-03-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2005-03-01
- date on which national standards
conflicting with the amendment have to be withdrawn (dow) 2007-03-01

Foreword to amendment A1

The text of document 61C/290/FDIS, future amendment 1 to IEC 60335-2-89:2002, prepared by SC 61C of the IEC Technical Committee 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A1 to EN 60335-2-89:2002 on 2005-02-01.

The following dates are applicable:

- latest date by which the amendment has to be
implemented at national level by publication of
an identical national standard or by endorsement (dop) 2005-12-01
- date on which national standards conflicting
with the amendment have to be withdrawn (dow) 2008-02-01

This amendment supplements or modifies the corresponding clauses of EN 60335-2-89:2002.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

Endorsement notice

The text of amendment 1:2005 to the International Standard IEC 60335-2-89:2002 was approved by CENELEC as an amendment to the European Standard without any modification.



Foreword to amendment A2

The text of document 61C/384/FDIS, future amendment 2 to IEC 60335-2-89:2002, prepared by SC 61C, Household appliances for refrigeration, of IEC Technical Committee 61, Safety of household and similar electrical appliances, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as amendment A2 to EN 60335-2-89:2002 on 2007-02-01.

The following dates are applicable:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2007-11-01
- date on which national standards conflicting with the amendment have to be withdrawn (dow) 2010-02-01

This amendment supplements or modifies the corresponding clauses of EN 60335-2-89:2002.

There are no special national conditions causing a deviation from this amendment.

There are no national deviations from this amendment.

Endorsement notice

The text of amendment 2:2007 to the International Standard IEC 60335-2-89:2002 was approved by CENELEC as an amendment to the European Standard without any modification.

CONTENTS

INTRODUCTION	7
1 Scope	8
2 Normative references	9
3 Definitions	9
4 General requirement	10
5 General conditions for the tests	11
6 Classification	12
7 Marking and instructions	12
8 Protection against access to live parts	15
9 Starting of motor-operated appliances	15
10 Power input and current	15
11 Heating	15
12 Void	18
13 Leakage current and electric strength at operating temperature	18
14 Transient overvoltages	18
15 Moisture resistance	18
16 Leakage current and electric strength	19
17 Overload protection of transformers and associated circuits	19
18 Endurance	19
19 Abnormal operation	19
20 Stability and mechanical hazards	21
21 Mechanical strength	21
22 Construction	22
23 Internal wiring	30
24 Components	30
25 Supply connection and external flexible cords	30
26 Terminals for external conductors	31
27 Provision for earthing	31
28 Screw and connections	31
29 Creepage distances, clearances, and distances through insulation	31
30 Resistance to heat and fire	32
31 Resistance to rusting	32
32 Radiation, toxicity and similar hazards	32

Annexes 35

Annex AA (normative) Locked-rotor test of fan motors 36

Annex BB (normative) Non-sparking “n” electrical apparatus 37

Annex ZAA (informative) The relevance of the pressure equipment directive 39

Annex ZC (normative) Normative references to international publications with their
corresponding European publications 41

Bibliography 42

Figure 101 – Apparatus for spillage test..... 33

Figure 102 – Scratching tool tip details 34

Figure AA.1 – Supply circuit for locked-rotor test of a single-phase fan motor 37

Table 101 – Maximum temperatures for motor-compressors 17

Table 102 – Refrigerant flammability parameters 28

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 and takes into account the way in which electromagnetic phenomena can affect the safe operation of appliances.

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 which 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 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor

1 Scope

This clause of Part 1 is replaced by the following.

This part of IEC 60335 specifies safety requirements for electrically operated commercial refrigerating appliances that have an incorporated compressor or that are supplied in two units for assembly as a single appliance in accordance with the manufacturer's instructions (split system).

NOTE 101 Examples of appliances that are within the scope of this standard are

- **refrigerated display** and **storage cabinets**;
- refrigerated trolley cabinets;
- service counters and self-service counters;
- blast chillers and blast freezers.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances.

It does not cover those features of construction and operation of refrigerating appliances which are dealt with in ISO standards.

NOTE 102 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;

A2 – in many countries, additional requirements are specified by national authorities. **A2**

NOTE 103 This standard does not apply to

- domestic refrigerating appliances (IEC 60335-2-24)
- industrial refrigerating systems;
- motor-compressors (IEC 60335-2-34);
- commercial dispensing appliances and vending machines (IEC 60335-2-75);
- commercial ice-cream appliances;
- commercial ice makers;
- cold temperature rooms;
- multiple refrigerated chambers with a remote compressor.

A1 NOTE 104 Appliances with a charge of more than 150 g of **flammable refrigerant** in each separate refrigerant circuit are not covered by this standard. For appliances with a charge greater than 150 g of **flammable refrigerant** in each refrigerant circuit and for the installation, ISO 5149 may be applied. Consequently, such appliances cannot be assessed for safety using this part 2. **A1**

2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

IEC 60079 (all parts), *Electrical apparatus for explosive gas atmospheres*

IEC 60079-4, *Electrical apparatus for explosive gas atmospheres – Part 4: Method of test for ignition temperatures*

IEC 60079-4A, *Electrical apparatus for explosive gas atmospheres – Part 4: Method of test for ignition temperatures – First supplement*

Ⓐ IEC 60079-15: 2005, *Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection "n" electrical apparatus* Ⓐ

IEC/TR3 60079-20, *Electrical apparatus for explosive gas atmospheres – Part 20: Data for flammable gases and vapours, relating to the use of electrical apparatus*

IEC 60335-2-5, *Household and similar electrical appliances – Safety – Part 2-5: Particular requirements for dishwashers*

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

ISO 817, *Organic refrigerants – Number designation*

Ⓐ Text deleted Ⓐ

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

3 Definitions

This clause of Part 1 is applicable except as follows.

3.1.9 Replacement:

normal operation

operation of the appliance under the following conditions:

refrigerating appliances are operated at an ambient temperature in accordance with 5.7, empty, with doors or lids closed, or roller blinds closed or open, whichever is the more unfavourable. User adjustable temperature control devices are short-circuited or otherwise rendered inoperative. Devices which are switched, by dew-point controls or clocks, are switched on or off, whichever is the more unfavourable.

Ⓐ Footnote deleted Ⓐ

For appliances connected to a water supply, the water other than cooling water, is at a temperature of $15\text{ °C} \pm 2\text{ °C}$. The cooling water is at the maximum temperature specified in the instruction.

For appliances with a separate **refrigerant condensing unit**, the **refrigerant condensing unit** is connected to the cabinet in accordance with the manufacturer's instructions.

3.101

refrigerated display and storage cabinet

enclosed cabinet which displays or stores chilled or frozen foodstuff placed therein and which is cooled by a **refrigerant condensing unit**

3.102

ancillary heating element

heating device which performs an auxiliary function, such as a defrost heater, door heater or anti-condensation heater

3.103

skilled person

person having the appropriate technical training and experience necessary to be aware of hazards to which he or she is exposed in performing a task and of measures necessary to minimize the danger to his or herself or other persons

3.104

refrigerant condensing unit

factory assembled unit for performing part of the refrigeration cycle (compression and condensation) comprising one or more refrigerant compressors with motors, condensers, liquid receivers, interconnecting pipe work and ancillary equipment, all mounted on a common base

3.105

flammable refrigerant

refrigerant with a flammability classification of group 2 or 3 in accordance with ISO 5149

NOTE For refrigerant blends which have more than one flammability classification, the most unfavourable classification is taken for the purposes of this definition.

3.106

free space

space with a volume exceeding 60 l in which a child can be entrapped and which is accessible after opening any door, lid or drawer and removing any **detachable internal part**, including shelves, containers or removable drawers which are themselves only accessible after opening any door or lid. In calculating the volume, a space with any single dimension not exceeding 150 mm or any two orthogonal dimensions each of which do not exceed 200 mm is ignored

4 General requirement

This clause of Part 1 is applicable except as follows.

Addition:

NOTE 101 The use of **flammable refrigerants** involves some additional hazards which are not associated with appliances which use non-**flammable refrigerants**.

This standard addresses the hazard due to ignition of leaked **flammable refrigerant** by potential ignition sources associated with the appliance.

The hazard due to ignition of leaked **flammable refrigerant** by an external potential ignition source associated with the environment in which the appliance is installed is compensated for by the low probability of ignition.

5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

5.2 Addition:

At least one additional specially prepared sample is required for the tests of 22.107.

NOTE 101 Unless the motor-compressor complies with IEC 60335-2-34, at least one additional specially prepared sample may be required for the test of 19.1.

NOTE 102 At least one additional sample of the fan motor, thermal motor protector combination may be required for the test of 19.1.

NOTE 103 The test of 22.7 may be performed on separate samples.

NOTE 104 Due to the potentially hazardous nature of the tests of 22.107, 22.108 and 22.109, special precautions may need to be taken when performing the tests.

5.3 Addition:

*Before starting the tests, the appliance shall be operated at **rated voltage** for at least 24 h, then switched off and left to stand for at least 12 h.*

5.7 Addition:

A₂ Tests in accordance with Clauses 10, 11 and 13 are performed at an ambient temperature of

32 °C ± 2 °C on appliances of climatic class 0, 1, 2, 3, 4 or 6;

43 °C ± 2 °C on appliances of climatic class 5 or 7. **A₂**

Before starting the tests specified in 10, 11 and 13, the appliance, with the doors or lids open, is brought to the ambient specified temperature ±2 K.

Other tests are performed at an ambient temperature of 20 °C ± 5 °C.

Appliances classified for several climatic classes are tested at the ambient temperature relevant to the highest climatic class.

NOTE 101 Steady conditions are considered to be established when three successive readings of the temperature, taken at approximately 60 min intervals, at the same point of any operating cycle, do not differ by more than 1 K.

5.10 Addition:

For the tests of 22.107, 22.108 and 22.109, the appliance is empty and installed as follows.

Built-in appliances are installed in accordance with the instructions for installation.

Other appliances are placed in a test enclosure, the walls of which enclose the appliance as closely as possible to all its sides and top surface, unless the manufacturer indicates in the instructions for installation that a free distance shall be observed from the walls or the ceiling, in which case this distance is observed during the test.

5.101 Appliances which use **flammable refrigerants** and which, according to the instructions, may be used with other electrical appliances inside a food storage compartment, are tested with such recommended appliances incorporated and in operation as they would be in normal use.

NOTE Examples of such electrical appliances are ice-cream makers and deodorizers.

6 Classification

This clause of Part 1 is applicable except as follows.

A2 6.101 Refrigerated display and storage cabinets shall be at least one of the following climatic classes:

- appliance of class 0;
- appliance of class 1;
- appliance of class 2;
- appliance of class 3;
- appliance of class 4;
- appliance of class 5;
- appliance of class 6;
- appliance of class 7.

Compliance is checked by inspection.

NOTE The climatic classes are specified in ISO 23953-2. **A2**

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Modification:

Replace the third dash by:

- **rated current**, in amperes;

Addition:

- the power input, in watts, of heating systems, if greater than 100 W;
- the defrosting power input, in watts, if the current corresponding to the defrosting power input is greater than the **rated current** of the appliance;
- A2** – one or more of the numerals; 0, 1, 2, 3, 4, 5, 6 or 7, indicating the climatic class of the appliance; **A2**
- for incandescent lamps, the maximum rated wattage of the lamp, in watts;
- for discharge lamps, the rated wattage of the lamp, in watts;
- the total mass of refrigerant for each separate refrigerant circuit;
- for a single component refrigerant, at least one of the following:
 - the chemical name,
 - the chemical formula,
 - the refrigerant number;