

Australian/New Zealand Standard™

**Household and similar electrical
appliances—Safety**

**Part 2.89: Particular requirements for
commercial refrigerating appliances and
ice-makers with an incorporated or
remote refrigerant unit or motor-
compressor**



AS/NZS 60335.2.89:2020

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-002, Safety of Household and Similar Electrical Appliances and Small Power Transformers. It was approved on behalf of the Council of Standards Australia on 17 June 2020 and by the New Zealand Standards Approval Board on 3 June 2020.

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This Standard was issued in draft form for comment as DR 19920.

Australian/New Zealand Standard™

Household and similar electrical appliances—Safety

Part 2.89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

AS/NZS 60335.2.89:2020**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2.89: Particular requirements for commercial refrigerating appliances and ice-makers with
an incorporated or remote refrigerant unit or motor-compressor****Foreword**

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-002 - Safety of Household and Similar Electrical Appliances and Small Power Transformers to supersede AS/NZS 60335.2.89:2010 three years from the date of publication of this Standard. During this period AS/NZS 60335.2.89:2010 will also remain current. Regulatory authorities that reference this Standard in regulation may apply these requirements at a different time. Users of this Standard should consult with these authorities to confirm their requirements.

The objective of this Standard is to provide manufacturers, designers, regulatory authorities, testing laboratories and similar organizations with safety requirements designed to give the user protection against hazards that might occur during normal operation and abnormal operation of the appliance and which may be used as the basis for approval for sale or for connection to the electricity supply mains in Australia and New Zealand.

The text of IEC 60335-2-89 Ed 3, prepared by IEC Technical Subcommittee SC 61C, was submitted to the Standards Australia/Standards New Zealand Combined Procedure (dual public comment and committee vote) for adoption of the IEC standard as a Standards Australia/Standards New Zealand joint standard.

The principal changes in this edition as compared with the 2010 edition of AS/NZS 60335.2.89 are as follows (minor changes are not listed):

- the text has been aligned with the 2011 edition of Part 1;
- some notes have been deleted or converted to normative text (4, 5.2, 7.6, 22.111, 22.111.1);
- some subclauses have been renumbered (22.103, 22.104, 22.105, 22.106, 22.107, 22.109, 22.110, 22.111, 22.112, 22.113, 22.114, 22.115);
- requirements for commercial ice-makers have been added (5.7, 5.101, 7.1, 11.8, 19.102);
- installation of appliances with a remote refrigerant unit or motor-compressor has been clarified (5.10, 11.2);
- installation instructions for appliances with a remote refrigerant unit employing R-744 refrigerant in a transcritical refrigeration system have been added (7.12.1);
- a pressure test for appliances employing R-744 refrigerant has been added (22.7);
- additional refrigerants have been added to Table 102 and it has been updated to reference only ISO 817 and ISO 5149-1 data;
- additional requirements for appliances with a refrigerant charge exceeding 150 g of flammable refrigerant within each refrigerating circuit have been added (7.1, 21.103, 22.108, 22.110, 22.116, 22.117, 22.118, 22.119, 22.120, 22.121, Annex CC).
- Annex AA has been modified to cover motors that are supplied at a voltage that is different from the rated voltage of the appliance;
- Annex BB has been updated to align with the latest edition of IEC 60079-15.

This Standard is an adoption with national modifications of the third edition of IEC 60335-2-89, *Household and similar electrical appliances – Safety – Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor*. It has been varied as indicated to take account of Australian and New Zealand conditions.

This part 2 has to be used in conjunction with the latest edition of AS/NZS 60335.1 *Household and similar electrical appliances – Safety – Part 1: General requirements* and its Amendments. It was established on the basis of AS/NZS 60335.1:2011.

This part 2 supplements or modifies the corresponding clauses of AS/NZS 60335.1 so as to convert it into the Australian/New Zealand Standard: Safety requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-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 letters AZ.

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.

p NOTE 3 In this document, p is used in the margin to indicate instructions for preparing a consolidated version.

The essential safety requirements in AS/NZS 3820¹ that could be applicable to requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor are covered by this standard.

The national variations to IEC 60335-2-89 Ed 3 form the Australian and New Zealand national variations for purposes of the IECEE scheme for recognition of results of testing to standards for safety of electrical equipment (the CB scheme).

¹ AS/NZS 3820 *Essential safety requirements for electrical equipment*

The text of the International Standard IEC 60335-2-89 Ed 3 was approved as a joint Australia/New Zealand Standard with the agreed national variations as given below.

AUSTRALIAN NATIONAL VARIATIONS

There are no national variations to this Part 2 other than those listed in the national variations in AS/NZS 60335.1:2011.

NEW ZEALAND NATIONAL VARIATIONS

There are no national variations to this Part 2 other than those listed in the national variations in AS/NZS 60335.1:2011.

**Annex ANZ
(normative)**
**Normative references to international publications with their corresponding joint
Australia/New Zealand publications**

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by national variations the relevant joint Australia/New Zealand publications applies if the national variations are needed to ensure the safety of the appliance for Australia/New Zealand conditions. These international publications are indicated by (mod). If an international publication is not so indicated, then either it or the listed Australia/New Zealand publication may be used.

| <u>Publication</u> | <u>Year</u> | <u>Title</u> | <u>AS/NZS</u> | <u>Year</u> |
|-----------------------|-------------|---|---------------|-------------|
| IEC 60079-7 | 2015 | <i>Explosive atmospheres – Part 7: Equipment protection by increased safety "e"</i> | | |
| IEC 60079-7:2015/AMD1 | 2017 | | | |
| IEC 60079-15 | 2017 | <i>Explosive atmospheres – Part 15: Equipment protection by type of protection "n"</i> | | |
| IEC 60079-29-1 | | <i>Explosive atmospheres – Part 29- 1: Gas detectors – Performance requirements of detectors for flammable gases</i> | | |
| IEC 60335-2-34 | 2012 | <i>Household and similar electrical appliances – Safety – Part 2-34: Particular requirements for motor- compressors</i> | 60335.2.34 | 2016 |
| IEC 60335-2-34/AMD1 | 2015 | | A1 | 2017 |
| IEC 60335-2-34/AMD2 | 2016 | | | |
| IEC 60730-2-6 | | <i>Automatic electrical controls – Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements</i> | | |
| ISO 817 | 2014 | <i>Refrigerants – Designation and safety classification</i> | | |
| ISO 817:2014/AMD1 | 2017 | | | |
| ISO 4126-2 | 2018 | <i>Safety devices for protection against excessive pressure – Part 2: Bursting disc safety devices</i> | | |
| ISO 5149-1 | 2014 | <i>Refrigerating systems and heat pumps – Safety and environmental requirements – Part 1: Definitions, classification and selection criteria</i> | | |
| ISO 5149-1:2014/AMD1 | 2015 | | | |

ISO 7010

Graphical symbols – Safety colours and safety signs – Registered safety signs

ISO 14903

Refrigerating systems and heat pumps – Qualification of tightness of components and joints

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-89: Particular requirements for commercial refrigerating appliances and ice-makers with an incorporated or remote refrigerant unit or motor-compressor

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.
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- 6) All users should ensure that they have the latest edition of this publication.
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- 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.

This part of International Standard IEC 60335 has been prepared by subcommittee 61C: Household appliances for refrigeration, of IEC technical committee 61: Safety of household and similar electrical appliances.

This third edition cancels and replaces the second edition published in 2010, Amendment 1:2012 and Amendment 2:2015. This edition constitutes a technical revision.

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

- the text has been aligned with Ed 5.2 of Part 1;
- some notes have been deleted or converted to normative text (4, 5.2, 7.6, 22.111, 22.111.1);

- some subclauses have been renumbered (22.103, 22.104, 22.105, 22.106, 22.107, 22.109, 22.110, 22.111, 22.112, 22.113, 22.114, 22.115);
- requirements for commercial ice-makers have been added (5.7, 5.101, 7.1, 11.8, 19.102);
- installation of appliances with a remote refrigerant unit or motor-compressor has been clarified (5.10, 11.2);
- installation instructions for appliances with a remote refrigerant unit employing R-744 refrigerant in a transcritical refrigeration system have been added (7.12.1);
- a pressure test for appliances employing R-744 refrigerant has been added (22.7);
- additional refrigerants have been added to Table 102 and it has been updated to reference only ISO 817 and ISO 5149-1 data;
- additional requirements for appliances with a refrigerant charge exceeding 150 g of flammable refrigerant within each refrigerating circuit have been added (7.1, 21.103, 22.108, 22.110, 22.116, 22.117, 22.118, 22.119, 22.120, 22.121, Annex CC);
- Annex AA has been modified to cover motors that are supplied at a voltage that is different from the rated voltage of the appliance;
- Annex BB has been updated to align with the latest edition of IEC 60079-15.

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

| | |
|--------------|------------------|
| FDIS | Report on voting |
| 61C/792/FDIS | 61C/796A/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 document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

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 commercial refrigerating appliances with an incorporated or remote refrigerant unit or compressor.

Where a particular subclause of Part 1 is not mentioned in this part 2, that subclause applies as far as is reasonable. Where 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 the associated noun are also in bold.

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.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations may need a transitional period following publication of a new, amended or revised IEC publication in which to make products in accordance with the new requirements and to equip themselves for conducting new or revised tests.

It is the recommendation of the committee that the content of this publication be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

The contents of the corrigendum of September 2019 have been included in this copy.

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 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 and ice-makers with an incorporated or remote refrigerant unit or motor-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 and **ice-makers** that have an incorporated motor-compressor or that are supplied in two units for assembly as a single appliance in accordance with the 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;
- **commercial ice-makers**.

As far as is practicable, this standard deals with the common hazards presented by these types of appliances including those that use **flammable refrigerants** and appliances employing R-744 refrigerant.

This International Standard is not applicable to appliances with a mass of **flammable refrigerant** exceeding the limits specified in 22.110 or to appliances with that use refrigerants with a toxicity classification of B according to ISO 817.

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

NOTE 102 Attention is drawn to the fact that

- for appliances intended to be used in vehicles or aboard ships or aircraft, additional requirements can be necessary;
- in many countries, additional requirements are specified by national health authorities, the national authorities responsible for the protection of labour, the national water supply authorities and similar authorities.

NOTE 103 This standard does not apply to

- appliances using **flammable refrigerant** in **transcritical refrigeration systems**;
- domestic refrigerating appliances (IEC 60335-2-24);
- split systems having a **refrigerant charge** of **flammable refrigerant** exceeding 150 g in any **refrigerating circuit**;
- industrial refrigerating systems;
- motor-compressors (IEC 60335-2-34);
- commercial dispensing appliances and vending machines (IEC 60335-2-75);
- commercial ice-cream appliances;
- cold temperature rooms;
- multiple refrigerated chambers with a remote motor-compressor.