

# INTERNATIONAL STANDARD



This full version of IEC 60335-2-75:2024 includes the content of the references made to IEC 60335-1:2020

**Household and similar electrical appliances – Safety –  
Part 2-75: Particular requirements for commercial dispensing appliances and  
vending machines**

get full document from [standards.iteh.ai](https://standards.iteh.ai)



**THIS PUBLICATION IS COPYRIGHT PROTECTED**  
**Copyright © 2024 IEC, Geneva, Switzerland**

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat  
3, rue de Varembe  
CH-1211 Geneva 20  
Switzerland

Tel.: +41 22 919 02 11  
[info@iec.ch](mailto:info@iec.ch)  
[www.iec.ch](http://www.iec.ch)

**About the IEC**

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

**About IEC publications**

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

**IEC publications search - [webstore.iec.ch/advsearchform](http://webstore.iec.ch/advsearchform)**

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, ...). It also gives information on projects, replaced and withdrawn publications.

**IEC Just Published - [webstore.iec.ch/justpublished](http://webstore.iec.ch/justpublished)**

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

**IEC Customer Service Centre - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)**

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: [sales@iec.ch](mailto:sales@iec.ch).

**IEC Products & Services Portal - [products.iec.ch](http://products.iec.ch)**

Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

**Electropedia - [www.electropedia.org](http://www.electropedia.org)**

The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.



# INTERNATIONAL STANDARD



This full version of IEC 60335-2-75:2024 includes the content of the references made to IEC 60335-1:2020

**Household and similar electrical appliances – Safety –  
Part 2-75: Particular requirements for commercial dispensing appliances and  
vending machines**

get full document from [standards.iteh.ai](https://standards.iteh.ai)

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

ICS 55.230

ISBN 978-2-8327-0116-4

**Warning! Make sure that you obtained this publication from an authorized distributor.**

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**IEC 60335-1**  
Edition 6.0 2020-09

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –**

**Part 1: General requirements**

**INTERPRETATION SHEET 1**

This interpretation sheet has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The text of this Interpretation Sheet is based on the following documents:

Draft	Report on voting
61/5999/DISH	61/6009/RVDISH

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

**INTRODUCTION**

Edition 6 of IEC 60335-1:2020 defines and introduces requirements for a detachable power supply part of an appliance. In the document, 24.2 prohibits the use of a power supply in a flexible cord.

**QUESTION:**

Does Subclause 24.2 prohibit the use of a detachable power supply part?

**ANSWER**

No, a "detachable power supply part" is a defined term and is not captured by the term "power supply" as used in Subclause 24.2.

NOTE A detachable power supply part is captured by the defined term when the output of the power supply part is detachable from the class III construction part of the appliance at:

- the power supply part, or
- the class III construction part of the appliance.

However, the supply cord (if any) does not have to be detachable from the detachable power supply part.

**ICS 13.120; 97.030**

## CONTENTS

FOREWORD.....	6
INTRODUCTION to IEC 60335-1:2020.....	9
INTRODUCTION to IEC 60335-2-75:2024.....	11
1 Scope.....	12
2 Normative references.....	13
3 Terms and definitions.....	18
4 General requirement.....	32
5 General conditions for the tests.....	32
6 Classification.....	37
7 Marking and instructions.....	38
8 Protection against access to live parts.....	48
9 Starting of motor-operated appliances.....	50
10 Power input and current.....	50
11 Heating.....	52
12 Charging of metal-ion batteries.....	61
13 Leakage current and electric strength at operating temperature.....	62
14 Transient overvoltages.....	65
15 Moisture resistance.....	66
16 Leakage current and electric strength.....	72
17 Overload protection of transformers and associated circuits.....	74
18 Endurance.....	74
19 Abnormal operation.....	75
20 Stability and mechanical hazards.....	87
21 Mechanical strength.....	88
22 Construction.....	90
23 Internal wiring.....	108
24 Components.....	111
25 Supply connection and external flexible cords.....	116
26 Terminals for external conductors.....	124
27 Provision for earthing.....	127
28 Screws and connections.....	129
29 Clearances, creepage distances and solid insulation.....	131
30 Resistance to heat and fire.....	140
31 Resistance to rusting.....	144
32 Radiation, toxicity and similar hazards.....	144
Annex A (informative) Routine tests.....	164
Annex B (normative) Battery-operated appliances, separable batteries and detachable batteries for battery-operated appliances.....	166
Annex C (normative) Ageing test on motors.....	187
Annex D (normative) Thermal motor protectors.....	188
Annex E (normative) Needle-flame test.....	189
Annex F (normative) Capacitors.....	190

Annex G (normative) Safety isolating transformers .....	192
Annex I (normative) Motors having basic insulation that is inadequate for the rated voltage of the appliance .....	195
Annex J (normative) Coated printed circuit boards .....	197
Annex K (informative) Overvoltage categories .....	198
Annex L (informative) Guidance for the measurement of clearances and creepage distances .....	199
Annex M (informative) Pollution degree .....	202
Annex N (normative) Proof tracking test.....	203
Annex O (informative) Selection and sequence of the tests of Clause 30 .....	204
Annex P (informative) Guidance for the application of this standard to appliances used in tropical climates .....	209
Annex Q (informative) Sequence of tests for the evaluation of electronic circuits .....	211
<b>Annex R (normative) Software evaluation .....</b>	<b>214</b>
Annex S (informative) Guidance for the application of this standard on measurement of power input and current based on the requirements of 10.1 and 10.2 concerning the representative period .....	228
Annex T (normative) UV-C radiation effect on non-metallic materials .....	229
Annex U (normative) Appliances intended for remote communication through public networks .....	232
<b>Annex AA (normative) Aging test for elastomeric parts.....</b>	<b>236</b>
<b>Annex BB (normative) Isolating transformers .....</b>	<b>238</b>
Bibliography.....	239
Index of defined terms .....	242
Figure 1 – Circuit diagram for leakage current measurement at operating temperature for single-phase connection of class II appliances and for parts of class II construction .....	145
Figure 2 – Circuit diagram for leakage current measurement at operating temperature for single-phase connection of other than class II appliances or parts of class II construction .....	146
Figure 3 – Circuit diagram for leakage current measurement at operating temperature for three-phase with neutral class II appliances and for parts of class II construction .....	147
Figure 4 – Circuit diagram for leakage current measurement at operating temperature for three-phase with neutral appliances other than those of class II or parts of class II construction .....	148
Figure 5 – Small part .....	149
Figure 6 – Example of an electronic circuit with low-power points .....	149
Figure 7 – Test finger nail .....	150
Figure 8 – Flexing test apparatus.....	151
Figure 9 – Constructions of cord anchorages .....	152
Figure 10 – An example of parts of an earthing terminal .....	153
Figure 11 – Examples of clearances .....	154
Figure 12 – Example of the placement of the cylinder .....	155
Figure 13 – Small parts cylinder.....	156
Figure 14 – Example of a specified operating region of a lithium-ion cell during charging .....	157
<b>Figure 101 – Probe for measuring surface temperatures .....</b>	<b>158</b>

Figure 102 – Circuit diagram for leakage current at operating temperature for single-phase electrode-type liquid heater with the equipotential bond connected to earth.....	159
Figure 103 – Circuit diagram for leakage current at operating temperature for three-phase electrode-type liquid heater with the equipotential bond connected to earth.....	160
Figure 104 – Splash apparatus .....	161
Figure 105 – Circuit diagram for single-phase electrode-type liquid heater in 22.117 .....	162
Figure 106 – Circuit diagram for three-phase electrode-type liquid heater in 22.117 .....	163
Figure B.1 – Examples of battery-operated appliance constructions and application of normative Annex B (1 of 2) .....	185
Figure B.2 – Examples of correct polarity connection marking representing three batteries .....	186
Figure I.1 – Simulation of faults .....	196
Figure L.1 – Sequence for the determination of clearances .....	199
Figure L.2 – Sequence for the determination of creepage distances .....	200
Figure L.3 – Measurement of clearances .....	201
Figure O.1 – Tests for resistance to heat .....	204
Figure O.2 – Selection and sequence of tests for resistance to fire in hand-held appliances .....	205
Figure O.3 – Selection and sequence of tests for resistance to fire in attended appliances .....	205
Figure O.4 – Selection and sequence of tests for resistance to fire in unattended appliances .....	206
Figure O.5 – Some applications of the term "within a distance of 3 mm" .....	208
Figure Q.1 – Flowchart outlining the sequence of tests for the evaluation of electronic circuits (1 of 2).....	212
Figure S.1 – Flowchart giving guidance on measurement of power input and current concerning the representative period .....	228
Table 1 – Power input deviation .....	50
Table 2 – Current deviation.....	51
Table 3 – Maximum normal temperature rises.....	55
Table 101 – Maximum temperature rises for specified external accessible surfaces of appliances of the professional type and in the maintenance area of all appliances under normal operating conditions .....	59
Table 102 – Maximum temperature rises for specified external accessible surfaces in the user area under normal operating conditions.....	60
Table 4 – Voltage for electric strength test.....	65
Table 5 – Characteristics of high-voltage sources .....	65
Table 6 – Impulse test voltage .....	66
Table 7 – Test voltages.....	73
Table 8 – Maximum winding temperature .....	78
Table 9 – Maximum abnormal temperature rise.....	83
Table 10 – Dimensions of cables and conduits.....	117
Table 11 – Minimum cross-sectional area of conductors .....	119
Table 12 – Pull force and torque .....	122
Table 13 – Nominal cross-sectional area of conductors .....	126

Table 14 – Torque for testing screws and nuts .....	130
Table 15 – Rated impulse voltage .....	132
Table 16 – Minimum clearances .....	133
Table 17 – Minimum creepage distances for basic insulation .....	137
Table 18 – Minimum creepage distances for functional insulation .....	138
Table 19 – Minimum thickness for accessible parts of reinforced insulation consisting of a single layer .....	140
Table A.1 – Test voltages .....	165
Table B.1 – Artificial source characteristics .....	168
Table B.2 – Total area of openings for metal-ion cells .....	176
Table B.3 – Volume of air injected at 2 070 kPa .....	176
Table C.1 – Test conditions .....	187
Table R.1 – General fault/error conditions .....	216
Table R.2 – Specific fault/error conditions .....	218
Table R.3 – Semi-formal methods .....	224
Table R.4 – Software architecture specification .....	224
Table R.5 – Module design specification .....	225
Table R.6 – Design and coding standards .....	226
Table R.7 – Software safety validation .....	226
Table T.1 – Minimum property retention limits after UV-C exposure .....	230
Table T.2 – Minimum electric strength for internal wiring after UV-C exposure .....	231
Table U.1 – Examples of acceptable measures against unauthorised access and transmission fault/error modes .....	234

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-75: Particular requirements for commercial dispensing appliances and vending machines

#### 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.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at <https://patents.iec.ch>. IEC shall not be held responsible for identifying any or all such patent rights.

**This extended version (EXV) of the official IEC Standard provides the user with the full content of the Standard.**

**IEC 60335-2-75:2024 EXV includes the content of IEC 60335-2-75:2024, and the references made to IEC 60335-1:2020.**

**The specific content of IEC 60335-2-75:2024 is displayed on a blue background.**

IEC 60335-2-75 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2012, Amendment 1:2015 and Amendment 2:2018. This edition constitutes a technical revision.

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

- a) alignment with IEC 60335-1:2020;
- b) conversion of some notes to normative text (Clause 1, 7.1, 19.2, 19.101);
- c) addition of requirements for electrode-type liquid heaters (Clause 1, 3.1.9, 3.6.101, 3.7.103, 13.2, 13.3, 16.2, 16.3, 19.1, 19.103 to 19.106, 22.6, 22.33, 22.115 to 22.118, 24.1.2, 27.1, Annex BB);
- d) addition of test requirements for appliances with a recommended ambient temperature above 25 °C (5.7);
- e) application of test probes 18 and 19 (8.1.1, 20.2, 22.101, B.22.3, B.22.4);
- f) addition of accessible surface temperature limits including marking of hot surfaces (7.1, 7.6, 7.12, 7.14, 7.15, 11.3, 11.8);
- g) addition of requirements to prevent simultaneous operation of multiple loads (22.114, Annex R);
- h) clarification of requirements for thermal cut-outs located in a service area (24.103).

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

Draft	Report on voting
61/7301/FDIS	61/7344/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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 unless that edition precludes it; in that case, the latest edition that does not preclude it is used. It was established on the basis of the sixth edition (2020) 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: Particular requirements for commercial dispensing appliances and vending machines.

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 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 [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE 4 The attention of National Committees is drawn to the fact that equipment manufacturers and testing organizations can 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 following differences exist in the countries indicated below.

- 6.1: Class 0I is allowed for appliances used indoors having a rated voltage not exceeding 150 V (Japan).
- 13.2: The leakage current limits are different (Japan).
- 16.2: The leakage current limits are different (Japan).

**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 to IEC 60335-1:2020

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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website –

[www.iec.ch/tc61/supportingdocuments](http://www.iec.ch/tc61/supportingdocuments)

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

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 the functions of an appliance are covered by different parts 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.

Throughout this publication, when "part 2" is mentioned, it refers to the relevant part of IEC 60335.

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 publications, basic safety publications and group safety publications 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.

Individual countries may wish to consider the application of this standard, as far as is reasonable, to appliances not mentioned in a part 2, and to appliances designed on new principles. In this case, consideration should be given to defining normal operation, specifying the classification of the appliance according to Clause 6 and specifying whether the appliance is operated attended or unattended. Consideration should also be given to particular categories of likely users and to related specific risks such as access to live parts, hot surfaces or hazardous moving parts.

An appliance that complies with the text of this standard will not necessarily be considered to comply with the safety principles of this 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 this standard.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.

# Sample Document

get full document from [standards.iteh.ai](https://standards.iteh.ai)

## INTRODUCTION to IEC 60335-2-75:2024

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.

Guidance documents concerning the application of the safety requirements for appliances can be accessed via TC 61 supporting documents on the IEC website

<https://www.iec.ch/tc61/supportingdocuments>

This information is given for the convenience of users of this International Standard and does not constitute a replacement for the normative text in this standard.

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 can 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 publications, basic safety publications and group safety publications 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.

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.

NOTE 3 Standards dealing with non-safety aspects of household appliances are:

- IEC standards published by TC 59 concerning methods of measuring performance;
- CISPR 11, CISPR 14-1 and relevant IEC 61000-3 series standards concerning electromagnetic emissions;
- CISPR 14-2 concerning electromagnetic immunity;
- IEC standards published by TC 111 concerning environmental matters.