

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –  
Part 2-61: Particular requirements for thermal storage room heaters**

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-61: Règles particulières pour les appareils de chauffage à accumulation**

IEC 60335-2-61:2002

<https://standards.iteh.ai/catalog/standards/iec/535367e5-b531-4589-a69b-866b5eab5d9f/iec-60335-2-61-2002>



## THIS PUBLICATION IS COPYRIGHT PROTECTED

Copyright © 2009 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.

Droits de reproduction réservés. Sauf indication contraire, aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'IEC ou du Comité national de l'IEC du pays du demandeur. Si vous avez des questions sur le copyright de l'IEC ou si vous désirez obtenir des droits supplémentaires sur cette publication, utilisez les coordonnées ci-après ou contactez le Comité national de l'IEC de votre pays de résidence.

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

Tel.: +41 22 919 02 11  
Fax: +41 22 919 03 00  
[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 corrigenda or an amendment might have been published.

#### IEC Catalogue - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

#### IEC publications search - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

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 also once a month by email.

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

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 15 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

#### IEC Glossary - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

#### 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: [csc@iec.ch](mailto:csc@iec.ch).

### A propos de l'IEC

La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

### A propos des publications IEC

Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

#### Catalogue IEC - [webstore.iec.ch/catalogue](http://webstore.iec.ch/catalogue)

Application autonome pour consulter tous les renseignements bibliographiques sur les Normes internationales, Spécifications techniques, Rapports techniques et autres documents de l'IEC. Disponible pour PC, Mac OS, tablettes Android et iPad.

#### Recherche de publications IEC - [www.iec.ch/searchpub](http://www.iec.ch/searchpub)

La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études,...). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

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

Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et aussi une fois par mois par email.

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

Le premier dictionnaire en ligne de termes électroniques et électriques. Il contient 20 000 termes et définitions en anglais et en français, ainsi que les termes équivalents dans 15 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

#### Glossaire IEC - [std.iec.ch/glossary](http://std.iec.ch/glossary)

65 000 entrées terminologiques électrotechniques, en anglais et en français, extraites des articles Termes et Définitions des publications IEC parues depuis 2002. Plus certaines entrées antérieures extraites des publications des CE 37, 77, 86 et CISPR de l'IEC.

#### Service Clients - [webstore.iec.ch/csc](http://webstore.iec.ch/csc)

Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: [csc@iec.ch](mailto:csc@iec.ch).



IEC 60335-2-61

Edition 2.2 2009-04  
CONSOLIDATED VERSION

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –  
Part 2-61: Particular requirements for thermal storage room heaters**

**Appareils électrodomestiques et analogues – Sécurité –  
Partie 2-61: Règles particulières pour les appareils de chauffage à accumulation**

[IEC 60335-2-61:2002](https://standards.iteh.ai/catalog/standards/iec/535367e5-b531-4589-a69b-866b5eab5d9f/iec-60335-2-61-2002)

<https://standards.iteh.ai/catalog/standards/iec/535367e5-b531-4589-a69b-866b5eab5d9f/iec-60335-2-61-2002>

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 13.120; 97.100.10

ISBN 2-8318-9977-X

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	5
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references .....	7
3 Definitions .....	7
4 General requirement.....	7
5 General conditions for the tests .....	8
6 Classification.....	8
7 Marking and instructions.....	8
8 Protection against access to live parts.....	10
9 Starting of motor-operated appliances .....	10
10 Power input and current .....	10
11 Heating .....	11
12 Void .....	12
13 Leakage current and electric strength at operating temperature.....	12
14 Transient overvoltages .....	13
15 Moisture resistance .....	13
16 Leakage current and electric strength.....	13
17 Overload protection of transformers and associated circuits .....	13
18 Endurance.....	13
19 Abnormal operation .....	13
20 Stability and mechanical hazards .....	15
21 Mechanical strength .....	15
22 Construction.....	16
23 Internal wiring.....	17
24 Components .....	17
25 Supply connection and external flexible cords .....	17
26 Terminals for external conductors.....	17
27 Provision for earthing .....	17
28 Screws and connections.....	18
29 Clearances, creepage distances and solid insulation .....	18
30 Resistance to heat and fire.....	18
31 Resistance to rusting.....	18
32 Radiation, toxicity and similar hazards.....	18
Annexes .....	20
Annex AA (informative) Immediate surrounds of air-outlet grilles .....	20
Bibliography.....	21
Figure 101 – Device for determining the air temperature rise .....	19
Table 101 – Temperature rises of surfaces .....	12

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

### HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

#### Part 2-61: Particular requirements for thermal-storage room heaters

#### 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 provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 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) 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 consolidated version of the official IEC Standard and its amendments has been prepared for user convenience.**

**IEC 60335-2-61 edition 2.2 contains the second edition (2002) [documents 61/2173/FDIS and 61/2254/RVD], its amendment 1 (2005) [documents 61/2814/FDIS and 61/2854/RVD] and its amendment 2 (2008) [documents 61/3642/FDIS and 61/3682/RVD].**

**A vertical line in the margin shows where the base publication has been modified by amendments 1 and 2.**

This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

The French version of this standard has not been voted upon.

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 fourth edition (2001) 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 electric thermal-storage room heaters.

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 following differences exist in the countries indicated below.

- 7.1: All thermal-storage room heaters have to be marked with a warning against covering (Sweden).

The committee has decided that the contents of the base publication and its amendments 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.

2 | 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 the amendment 2 be adopted for implementation nationally not earlier than 12 months or later than 36 months from the date of publication.

## 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.

- 2 | 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.

<https://www.internationalstandards.org> | 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. -2002

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 2-61: Particular requirements for thermal-storage room heaters

#### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **thermal-storage room heaters** for household and similar purposes that are intended to heat the room in which they are located, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

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.

As far as is practicable, this standard deals with the common hazards presented by appliances that are encountered by all persons in and around the home. However, in general, it does not take into account:

- 2 | – persons (including children) whose
- physical, sensory or mental capabilities; or
  - lack of experience and knowledge
- prevents them from using the appliance safely without supervision or instruction;
- children playing with the appliance.

NOTE 101 Attention is drawn to the fact that

- this standard only applies to self-contained **thermal-storage room heaters**. However, it may be used as a guide, in so far as it reasonably applies, to determine the requirements and test specifications for other **thermal-storage room heaters**;
- for heaters incorporating direct-acting heating elements, IEC 60335-2-30 is also applicable;
- for heaters intended to be used in vehicles or on board ships or aircraft, additional requirements may be necessary;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities.

NOTE 102 This standard does not apply to

- appliances intended exclusively for industrial purposes;
- heaters incorporated in the building structure;
- central heating systems;
- heaters for saunas (IEC 60335-2-53);
- flexible sheet heating elements for room heating (IEC 60335-2-96);
- heaters intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas).



## 2 Normative references

This clause of Part 1 is applicable except as follows.

*Addition:*

IEC 60335-2-30, *Household and similar electrical appliances – Safety – Part 2-30: Particular requirements for room heaters*

ISO 3864-1, *Graphical symbols – Safety colours and safety signs – Part 1: Design principles for safety signs in workplaces and public areas*

## 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

The heater is operated in cycles, each cycle having a duration of 24 h and consisting of a charging period and a discharging period. The charging period is terminated when all heating elements are disconnected for the first time by the devices controlling the temperature of the core (charge controls).

#### 3.101

##### thermal-storage room heater

heater constructed to store heat obtained from electrical energy in a heat-accumulating core and to discharge it at any time

#### 3.102

##### controlled-output heater

**thermal-storage room heater**, the heat output of which can be controlled by means such as fans, shutters or flaps

#### 3.103

##### free-output heater

**thermal-storage room heater**, the heat output of which is discharged by natural convection and radiation and can only be varied by adjusting the charge

#### 3.104

##### rated charging period

longest uninterrupted charging period assigned to the heater by the manufacturer

#### 3.105

##### rated charge

energy consumption assigned to the heater by the manufacturer for a **rated charging period**

## 4 General requirement

This clause of Part 1 is applicable.

## 5 General conditions for the tests

This clause of Part 1 is applicable except as follows.

### 5.5 Addition:

*For **controlled-output heaters** having auxiliary air-outlets, air is discharged only through the main outlet into the room where the heater is situated.*

NOTE 101 Movable parts include accessories supplied with the heater, such as shelves and humidifiers.

### 5.6 Addition:

***Thermostats** sensitive to the room air temperature, such as those having a sensing element located in the air-inlet, are short-circuited.*

### 5.9 Addition:

*When it is specified that direct-acting heating elements are operated together with the storage heating elements, this only applies if allowed by the construction.*

## 6 Classification

The clause of Part 1 is applicable except as follows.

### 6.1 Modification:

**Thermal-storage room heaters** shall be **class I**, **class II** or **class III**.

## 7 Marking and instructions

The clause of Part 1 is applicable except as follows.

### 7.1 Modification:

Appliances shall be marked with **rated power input**.

#### *Addition:*

Appliances shall be marked with

- the **rated charging period**, in hours;
- the mass of the assembled appliance, in kilograms.

For appliances provided with more than one means of connection to the supply, each supply circuit shall be marked with **rated voltage**, **rated power input** and the symbol for nature of supply.

If the temperature rises determined during the tests of Clause 19 exceed the limits specified in Clause 11, appliances shall be marked with symbol IEC 60417-5641 (DB:2002-10) combined with the prohibition sign of ISO 3864-1, except for colours, or with the substance of the following:

WARNING: Do not cover.

NOTE 101 This marking may be on a label that is permanently attached to the appliance.

#### 7.6 Addition:



Do not cover

NOTE This symbol incorporates symbol IEC 60417-5641(DB:2002-10) combined with the prohibition sign of ISO 3864-1, except for colours.

#### 7.10 Addition:

Charging controls shall not be marked with the **off position** unless they have a contact separation in all poles to provide full disconnection under overvoltage category III conditions. However, disconnection of the neutral pole is not required for single phase appliances permanently connected to a system with an earthed neutral (TN-S-C system).

#### 7.12 Addition:

The instructions shall be given on a durable card or in a booklet and shall include the substance of the following:

- these instructions should be retained for future reference;
- fumes may be emitted during the first few operations of the heater and the room should be kept well ventilated.

The instructions shall also include

- the **rated charge**;
- the minimum distance to be maintained between the heater and combustible materials, such as furniture and curtains.

If the temperature rises determined during the tests of Clause 19 exceed the limits specified in Clause 11, the instructions shall include the substance of the following:

- do not cover;
- do not place objects in contact with the heater.

If the “Do not cover” symbol is marked on the appliance, its meaning shall be explained.

#### 7.12.1 Addition:

The installation instructions shall include the substance of the following:

- the installation of the heater should be carried out by trained personnel;
- if, during reassembly of the heater, a part of the thermal insulation shows damage or deterioration, it should be replaced by an identical part;

- to maintain stability, it is essential that the heater is placed on a level surface and care should be taken to avoid irregular surfaces, such as may result from carpets or tiled surrounds partially protruding under the heater.

The installation instructions shall also include

- a circuit diagram with a clear indication of the terminals;
- details for fixing the heater to the floor or for fixing the heater to the wall, including the minimum mounting height (if applicable).

#### 7.14 Addition:

The height of the “Do not cover” symbol shall be at least 15 mm.

The height of the words “Do not cover” shall be at least 3 mm.

*Compliance is checked by measurement.*

#### 7.15 Addition:

The marking concerning covering shall be visible after the heater has been installed.

### 8 Protection against access to live parts

This clause of Part 1 is applicable.

### 9 Starting of motor-operated appliances

This clause of Part 1 is not applicable.

### 10 Power input and current

This clause of Part 1 is applicable except as follows.

#### 10.1 Addition:

*Heaters are installed as specified in 11.2.*

*The power input of the storage heating elements is measured during the charging period, any fans, shutters, flaps and similar devices being adjusted to cause minimum heat discharge.*

*The power input of direct-acting heating elements is measured during a discharge period, any fans, shutters, flaps and similar devices being adjusted to cause maximum heat discharge.*

*The total power input for each means of connection to the supply is measured with all controls adjusted to the position resulting in the highest power input.*

NOTE 101 For heaters incorporating motors, the tolerances specified for heating appliances apply.