

# INTERNATIONAL STANDARD

**IEC**  
**60335-2-35**

Fourth edition  
2002-10

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

### **Part 2-35: Particular requirements for instantaneous water heaters**

*Appareils électrodomestiques et analogues –  
Sécurité –*

*Partie 2-35:  
Règles particulières pour les chauffe-eau instantanés*



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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –  
SAFETY –

## Part 2-35: Particular requirements for instantaneous water heaters

## FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

<https://www.internationalstandards.org/> This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances. 60335-2-35:2002

This fourth edition cancels and replaces the third edition published in 1997 and its amendment 1 (1999). It constitutes a technical revision.

The text of this part of IEC 60335 is based on the following documents:

FDIS	Report on voting
61/2170/FDIS	61/2251/RVD

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

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 instantaneous water 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 committee has decided that the contents of this publication will remain unchanged until 2004. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

The following differences exist in the countries indicated below.

- 6.1: Bare-element water heaters are not allowed (Greece, Indonesia, Israel, Malaysia, Singapore and Turkey).
- 6.1: Class 0I appliances are allowed (Japan).
- 7.1: Closed water heaters having a rated pressure less than 1,0 MPa have to be marked with a statement that a pressure reducing valve is to be fitted in the installation (Sweden).
- 7.1: Marking of rated pressure is different and marking of water resistivity is not required (USA).
- 7.12: Information concerning the removal of air from bare-element water heaters has to be given (Poland).
- 7.12.1: The installation of bare-element water heaters has to comply with particular conditions dependent on the supply system and which are to be included in the instructions (France, Poland and Spain).
- 19.4: Flow switches tested for reliability are not short-circuited (USA).
- 19.13: The water temperature in closed water heaters having a capacity in excess of 15 l is limited to 99 °C (Israel, Norway and United Kingdom).
- 19.13: The water temperatures are different (USA).
- 22.101: For closed water heaters, the minimum rated pressure is 1,0 MPa (Norway).
- 22.103: Closed water heaters having a capacity in excess of 15 l have to be provided with a pressure relief device (Israel).
- 22.103: Closed water heaters have to incorporate a temperature relief valve or a combined temperature and pressure relief valve that has to operate before the water temperature reaches 100 °C (United Kingdom).
- 22.103: The pressure relief valve is not required to be provided with the heater (USA).

A bilingual version of this publication may be issued at a later date.

## 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.

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.

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.

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.

<https://standards.iteh.ai/standards/iec/60335-2-35:2002>

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# HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

## Part 2-35: Particular requirements for instantaneous water heaters

### 1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of electric **instantaneous water heaters** for household and similar purposes and intended for heating water below boiling temperature, their **rated voltage** being not more than 250 V for single-phase appliances and 480 V for other appliances.

NOTE 101 **Instantaneous water heaters** incorporating bare heating elements are within the scope of this standard.

Appliances not intended for normal household use but which nevertheless may be a source of danger to the public, such as appliances intended for use 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 which are encountered by all persons in and around the home. However, in general, it does not take into account

- the use of appliances by young children or infirm persons without supervision;
- playing with the appliance by young children.

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;
- in many countries additional requirements are specified by the national health authorities, the national authorities responsible for the protection of labour and similar authorities;
- in many countries regulations exist for the installation of equipment connected to the water mains.

NOTE 103 This standard does not apply to

- appliances for boiling water (IEC 60335-2-15);
- storage water heaters (IEC 60335-2-21);
- appliances intended exclusively for industrial purposes;
- appliances intended to be used in locations where special conditions prevail, such as the presence of a corrosive or explosive atmosphere (dust, vapour or gas);
- commercial dispensing appliances and vending machines (IEC 60335-2-75).

### 2 Normative references

This clause of Part 1 is applicable.

### 3 Definitions

This clause of Part 1 is applicable except as follows.



### 3.1.9 Replacement:

#### normal operation

operation of the appliance while supplied with water, the flow being adjusted to attain the highest outlet water temperature without operation of the **thermal cut-out**

### 3.101

#### instantaneous water heater

**stationary appliance** for heating water while it flows through the appliance

NOTE Instantaneous water heaters are referred to as water heaters.

### 3.102

#### closed water heater

**instantaneous water heater** intended to operate at the pressure of the water system, the flow of water being controlled by one or more valves in the outlet system

NOTE The operating pressure may be the output pressure of a reducing or boosting device.

### 3.103

#### open-outlet water heater

**instantaneous water heater** in which the flow of water is controlled by a valve in the inlet pipe, there being no valve in the outlet pipe

### 3.104

#### bare-element water heater

**instantaneous water heater** in which uninsulated heating elements are immersed in the water

### 3.105

#### rated pressure

water pressure assigned to the appliance by the manufacturer

### 3.106

#### flow switch

switch that operates in response to a flow of water

### 3.107

#### pressure switch

switch that operates in response to a change in pressure

## 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.

### 5.2 Addition:

NOTE 101 Additional samples may be required for the tests of 22.109.

### 5.3 Addition:

*When the tests are carried out on a single appliance, the tests of 22.102, 22.107, 22.108 and 24.102 are carried out before the tests of Clause 19.*

### 5.7 Addition:

Water having a temperature of  $15\text{ °C} \pm 5\text{ °C}$  is used for the tests.

## 6 Classification

This clause of Part 1 is applicable except as follows.

### 6.1 Modification:

**Bare-element water heaters** shall be **class I** or **class III**.

Other water heaters shall be **class I**, **class II** or **class III**.

### 6.2 Addition:

Water heaters shall be at least IPX1.

NOTE 101 A higher degree of protection may be required depending on the zone in which the water heater is installed, as specified in IEC 60364.

## 7 Marking and instructions

This clause of Part 1 is applicable except as follows.

### 7.1 Addition:

NOTE 101 The minimum rated frequency for **bare-element water heaters** is 50 Hz.

Appliances shall be marked with the **rated pressure** in pascals.

**Bare-element water heaters** shall be marked with the substance of the following:

The water resistivity must not be less than...  $\Omega\text{cm}$ .

NOTE 102 The value of the water resistivity is not to exceed 1 300  $\Omega\text{cm}$  at a temperature of 15 °C.

### 7.12 Addition:

The instructions for **open-outlet water heaters** to be used with a spray head shall state that the spray head must be descaled regularly.

The instructions shall include the substance of the following:

WARNING: Do not switch on if there is a possibility that the water in the heater is frozen.

NOTE 101 This warning is not required if the appliance incorporates a **flow switch**.

#### 7.12.1 Addition:

The installation instructions for **open-outlet water heaters** shall state that the outlet must not be connected to any tap or fitting other than those specified.