

SRI LANKA STANDARD 1193 : 2015
IEC 60335-2-74 : 2009
UDC 683.79

SPECIFICATION FOR
ELECTRIC IMMERSION WATER HEATERS
(Third Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR ELECTRIC IMMERSION WATER HEATERS
(Third Revision)

SLS 1193 : 2015
IEC 60335-2-74 : 2009

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SRI LANKA STANDARDS INSTITUTION
17, Victoria Place
Elvitigala Mawatha
Colombo 8
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Sri Lanka Standard
SPECIFICATION FOR ELECTRIC IMMERSION WATER HEATERS
(Third Revision)

NATIONAL FOREWORD

This standard was approved by the Sectoral Committee on Electric Appliances and Accessories and was authorized for adoption and publication as a Sri Lanka Standard by the Council of Sri Lanka Standards Institution on 2015- 07-03.

This is the Third revision of the **SLS 1193 : 2015** and identical with **IEC 60335-2-74** Household and similar electrical appliances - Safety-Particular requirements for portable immersion heaters Edition 2.2 2009 - 11 published by the International Technical Commission (IEC).

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the results of a test or an analysis shall be rounded off in accordance with **SLS 102**. The number of significant places to be retained in the rounded off value shall be the same as that of the specified value in the standard.

Terminology and conventions

The text of the International Standard has been accepted as suitable for publication without deviation as a Sri Lanka Standard. However, certain terminology and conventions are not identical with those used in Sri Lanka Standards ; attention is therefore drawn to the following:

- a) Wherever the words “International Standard” appear referring to this standard they should be interpreted as “Sri Lanka Standard”.
- b) Wherever the page numbers are quoted they are page numbers of IEC standard.
- c) The coma has been used as a decimal marker. In Sri Lanka Standards it is the current practice to use a full point on the base line as a decimal marker.
- d) Whenever standard value of rated frequency appears it shall be taken as 50 Hz.

Cross references

International Standards

Corresponding Sri Lanka Standards

IEC 60227 : Polyvinyl chloride insulated cables of rated voltage up to and including 450/750 V

SLS 733 : PVC insulated, Non armoured cables with copper conductors, voltages upto and including 450/750, for electric power, lighting and internal wiring

IEC 60529: Degrees of protection provided by enclosures (IP code)

SLS 963: Classification for degrees of protection provided by enclosures (IP Code)

IEC 60068-2-2 Environmental testing Part 2-2 : Tests - Test B : Dry heat

SLS 580 : Basic environmental basic procedures. Part 2.2 Test B : Dry heat

NOTE : *Corresponding Sri Lanka Standards for other International Standards listed under references in IEC 60335-2-74, are not available.*

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –
Part 2-74: Particular requirements for portable immersion heaters**

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-74: Règles particulières pour les thermoplongeurs mobiles**





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IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland
Email: inmail@iec.ch
Web: www.iec.ch

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Email: csc@iec.ch
Tél.: +41 22 919 02 11
Fax: +41 22 919 03 00



INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Household and similar electrical appliances – Safety –
Part 2-74: Particular requirements for portable immersion heaters**

**Appareils électrodomestiques et analogues – Sécurité –
Partie 2-74: Règles particulières pour les thermoplongeurs mobiles**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

PRICE CODE
CODE PRIX **CE**

ICS 13.120; 97.040.50

ISBN 978-2-88910-165-8

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES –
SAFETY –****Part 2-74: Particular requirements for portable immersion 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.
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This part of International Standard IEC 60335 has been prepared by IEC technical committee 61: Safety of household and similar electrical appliances.

This consolidated version of IEC 60335-2-74 consists of the second edition (2002) [documents 61/2177/FDIS and 61/2258/RVD], its amendment 1 (2006) [documents 61/2962/CDV and 61/3028/RVC] and its amendment 2 (2009) [documents 61/3867/FDIS and 61/3913/RVD].

The technical content is therefore identical to the base edition and its amendments and has been prepared for user convenience.

It bears the edition number 2.2.

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

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 portable electric immersion 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.

- 19.2: The test is carried out with the appliance suspended by its supply cord (Poland).
- Clause 21: The additional test is only carried out on appliances with a non-metallic enclosure (USA).
- 24.101: This requirement is not applicable (USA).

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 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.

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.

HOUSEHOLD AND SIMILAR ELECTRICAL APPLIANCES – SAFETY –

Part 2-74: Particular requirements for portable immersion heaters

1 Scope

This clause of Part 1 is replaced by the following.

This International Standard deals with the safety of **portable electric immersion heaters** for household and similar purposes, their **rated voltage** being not more than 250 V.

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 knowledgeprevents them from using the appliance safely without supervision or instruction;
 - children playing with the appliance.

NOTE 101 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.

NOTE 102 This standard does not apply to

- 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);
- heating elements incorporated in **portable appliances**, such as appliances for heating liquids (IEC 60335-2-15);
- aquarium heaters (IEC 60335-2-55);
- fixed immersion heaters (IEC 60335-2-73).

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 in a vessel filled with water to the minimum depth of immersion

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.

5.3 Addition:

2 | *The additional test of 21.1 is carried out before the tests of Clause 8.*

6 Classification

This clause of Part 1 is applicable except as follows.

6.2 Addition:

Immersion heaters shall be at least IPX7.

7 Marking and instructions

This clause of Part 1 is applicable except as follows.

7.1 Addition:

Appliances shall be marked with the maximum and minimum depths of immersion.

NOTE 101 The depths of immersion may be indicated by lines only, provided that they are explained in the instructions.

NOTE 102 The marking is not required on appliances intended to float.

7.12 Addition:

The instructions shall include the substance of the following:

- details of suitable vessels to be used;
- unplug the immersion heater before removing it from the liquid;
- after unplugging, the heating element will remain hot and should not be touched or placed on combustible surfaces.

| The instructions shall state that the appliance is not intended to be operated by means of an external timer or a separate remote-control system.

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.

11 Heating

This clause of Part 1 is applicable except as follows.

11.7 Addition:

Appliances are operated for 15 min after the water temperature has reached 95 °C. However, if this temperature cannot be attained, the immersion heater is operated for 15 min after the water temperature has stabilized, or for 15 min after a thermal control has operated.

12 Void

13 Leakage current and electric strength at operating temperature

This clause of Part 1 is applicable.

14 Transient overvoltages

This clause of Part 1 is applicable.

15 Moisture resistance

This clause of Part 1 is applicable.

16 Leakage current and electric strength

This clause of Part 1 is applicable.

17 Overload protection of transformers and associated circuits

This clause of Part 1 is applicable.

18 Endurance

This clause of Part 1 is not applicable.

19 Abnormal operation

This clause of Part 1 is applicable except as follows.

19.1 Addition:

Only appliances intended to prevent water from freezing in animal troughs are subjected to the tests of 19.4 and 19.5.

19.2 Addition:

Appliances are placed on the floor of the test corner in the most unfavourable position.

19.13 Addition:

A temperature rise of 200 K is allowed during the first minute of operation for the walls and floor of the test corner.

20 Stability and mechanical hazards

This clause of Part 1 is applicable.

21 Mechanical strength

This clause of Part 1 is applicable except as follows.

21.1 Addition:

The appliance is dropped from a height of 1 m onto a hardwood board having a thickness of 50 mm. It is dropped four times, once on the handle, once on the end of the heating element and twice from a horizontal position.

22 Construction

This clause of Part 1 is applicable.

23 Internal wiring

This clause of Part 1 is applicable.

24 Components

This clause of Part 1 is applicable except as follows.

24.101 Thermal cut-outs incorporated in appliances in order to comply with Clause 19 shall not be self-resetting.

Compliance is checked by inspection.

25 Supply connection and external flexible cords

This clause of Part 1 is applicable except as follows.

25.5 Modification:

Appliances shall not be fitted with **type X attachments**.

Type Z attachment is allowed.

26 Terminals for external conductors

This clause of Part 1 is applicable.

27 Provision for earthing

This clause of Part 1 is applicable.

28 Screws and connections

This clause of Part 1 is applicable.

29 Clearances, creepage distances and solid insulation

This clause of Part 1 is applicable.

30 Resistance to heat and fire

This clause of Part 1 is applicable except as follows.

30.2 Addition:

*For appliances intended to prevent water from freezing in animal troughs, 30.2.3 is applicable.
For other appliances, 30.2.2 is applicable.*

31 Resistance to rusting

This clause of Part 1 is applicable.

32 Radiation, toxicity and similar hazards

This clause of Part 1 is applicable.

Annexes

The annexes of Part 1 are applicable.

Bibliography

The bibliography of Part 1 is applicable except as follows.

Addition:

IEC 60335-2-15, *Household and similar electrical appliances – Safety – Part 2-15: Particular requirements for appliances for heating liquids*

IEC 60335-2-55, *Household and similar electrical appliances – Safety – Part 2-55: Particular requirements for electrical appliances for use with aquariums and garden pools*

IEC 60335-2-73, *Household and similar electrical appliances – Safety – Part 2-73: Particular requirements for fixed immersion heaters*

- 2 | ISO 13732-1, *Ergonomics of the thermal environment – Methods for the assessment of human responses to contact with surfaces – Part 1: Hot surfaces*

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

3, rue de Varembé
PO Box 131
CH-1211 Geneva 20
Switzerland

Tel: + 41 22 919 02 11
Fax: + 41 22 919 03 00
info@iec.ch
www.iec.ch

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