



SLOVENSKI STANDARD
SIST EN IEC 63159-2-1:2022

01-februar-2022

Gospodinjski električni pretočni grelniki vode - Metode za merjenje lastnosti - 2-1.
del: Večnamenski električni pretočni grelniki vode

Household electric instantaneous water heaters - Methods for measuring the performance - Part 2-1: Multifunctional electric instantaneous water heaters

iTeh STANDARD
PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: EN IEC 63159-2-1:2021
SIST EN IEC 63159-2-1:2022

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>

ICS:

91.140.65	Oprema za ogrevanje vode	Water heating equipment
97.100.10	Električni grelniki	Electric heaters

SIST EN IEC 63159-2-1:2022

en

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

SIST EN IEC 63159-2-1:2022

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>

EUROPEAN STANDARD

EN IEC 63159-2-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2021

ICS 91.140.65

English Version

Household electric instantaneous water heaters - Methods for
measuring the performance - Part 2-1: Multifunctional electric
instantaneous water heaters
(IEC 63159-2-1:2021)

Chauffe-eau instantanés électrodomestiques - Méthodes de
mesure de l'aptitude à la fonction - Partie 2-1: Chauffe-eau
instantanés électriques multifonctions
(IEC 63159-2-1:2021)

Elektro-Durchfluss-Wassererwärmer für den Hausgebrauch
- Prüfverfahren zur Messung der Gebrauchseigenschaften -
Teil 2-1: Multifunktionelle Elektro-Durchfluss-
Wassererwärmer
(IEC 63159-2-1:2021)

This European Standard was approved by CENELEC on 2021-11-25. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 63159-2-1:2021 (E)**European foreword**

The text of document 59C/268/FDIS, future edition 1 of IEC 63159-2-1, prepared by SC 59C “Electrical heating appliances for household and similar purposes” of IEC/TC 59 “Performance of household and similar electrical appliances” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63159-2-1:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2022-08-25 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-11-25 document have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document is read in conjunction with EN IEC 63159-1:2021.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

iTeh STANDARD

PREVIEW

(standards.iteh.ai)

The text of the International Standard IEC 63159-2-1:2021 was approved by CENELEC as a European Standard without any modification.

[SIST EN IEC 63159-2-1:2022](https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022)

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

The Annex ZA of EN IEC 63159-1:2021 applies with the following changes:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
<i>Add the following reference:</i>				
IEC 63159-1	2021	Household electric instantaneous water heaters - Methods for measuring the performance - Part 1: General aspects	EN IEC 63159-1	2021

(standards.iteh.ai)

SIST EN IEC 63159-2-1:2022

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>

**iTeh STANDARD
PREVIEW
(standards.iteh.ai)**

SIST EN IEC 63159-2-1:2022

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>



IEC 63159-2-1

Edition 1.0 2021-10

INTERNATIONAL STANDARD

NORME INTERNATIONALE

iTeh STANDARD

Household electric instantaneous water heaters – Methods for measuring the performance –

Part 2-1: Multifunctional electric instantaneous water heaters

Chauffe-eau instantanés électrodomestiques – Méthodes de mesure de l'aptitude à la fonction –

Partie 2-1: Chauffe-eau instantanés électriques multifonctions

2022

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 91.140.65

ISBN 978-2-8322-1040-6

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.....	4
1 Scope.....	6
2 Normative references	6
3 Terms and definitions	6
4 General test conditions.....	8
4.3 General conditions	8
4.4 Test setup	8
4.101 Symbols and units	8
4.102 Time constants (measuring time).....	9
4.103 Test setup	9
4.103.1 Measurement setup.....	9
4.103.2 Setpoints	9
4.103.3 Measurement of flow pressure and flow rate.....	9
4.103.4 Temperature measurement.....	9
5 Energy efficiency	10
6 Performance tests	10
6.1 Determination of classification factor CF	10
6.1.1 General	10
6.1.2 Definition of a reference instantaneous water heater	10
6.1.3 Calculation method of nominal energy consumption.....	11
6.1.4 Determination of energy demand of the sample	11
6.1.5 Definition of classes H and E	11
6.2 Determination of flow rates.....	11
6.2.1 General	11
6.2.2 E class water heater	11
6.2.3 H class water heater	12
6.2.4 Determination of the flow rate as a function of the pressure difference	13
6.3 Pressure difference on activation of the heating capacity	13
6.3.1 General	13
6.3.2 E class water heater	13
6.3.3 H class water heater	13
6.4 Behaviour at switch-on of the appliance	14
6.4.1 General	14
6.4.2 E class water heater	14
6.4.3 H class water heater	15
6.5 Behaviour following the change of the flow rate	15
6.5.1 General	15
6.5.2 E class water heater	15
6.5.3 H class water heater	16
6.6 Behaviour following interruption of the flow	17
6.6.1 General	17
6.6.2 E class water heater	17
6.6.3 H class water heater	18
6.7 Behaviour at constant temperature setting	19
6.7.1 General	19
6.7.2 E class water heater	19

6.7.3	H class water heater	19
6.8	Behaviour following the change of the temperature selector setting	19
6.8.1	General	19
6.8.2	Electronically controlled appliances	19
6.8.3	H class water heater	20
6.9	Behaviour at voltage limits	20
6.10	Additional tests for electronic instantaneous water heaters	21
6.10.1	General	21
6.10.2	Behaviour of the outlet temperature at decreasing water inlet temperature	21
6.10.3	Behaviour of the outlet temperature at changing water inlet temperature	22
Annex A (normative)	Load pattern	23
Annex B (normative)	Test setup	24
Bibliography	29
Figure B.101	– Single point (vented)	24
Figure B.102	– Multi point (unvented)	25
Figure B.103	– Test setup	26
Figure B.104	– Damping device (Detail 4)	27
Figure B.105	– Water connection part (Detail 5)	27
Figure B.106	– Water connection part (Detail 6)	28
Table 101	– Symbols and units	8
Table 102	– Nominal values for E class water heater	12
Table 103	– Nominal values for H class water heater	12
Table 104	– Flow pressure and flow rate for multi point appliances	13
Table 105	– Flow pressure and flow rate for single point appliances	13
Table 106	– Pressure difference and flow rate	13
Table 107	– Pressure difference and flow rate	14
Table 108	– Behaviour at switch on of the appliance at different temperature selector settings	15
Table 109	– Behaviour at switch on of the appliance at different settings	15
Table 110	– Behaviour following the change of the flow rate at different temperature selector settings	16
Table 111	– Behaviour following the change of the flow rate at different settings	17
Table 112	– Behaviour following interruption of the flow	18
Table 113	– Behaviour following interruption of the flow	18
Table 114	– Behaviour at constant temperature setting	19
Table 115	– Behaviour following the change of the temperature selector setting at a flow rate of 50%	20
Table 116	– Behaviour following the change of the temperature selector setting at a flow rate of 100%	20
Table 117	– Behaviour at voltage limits	21
Table 118	– Behaviour of the outlet temperature at decreasing water inlet temperature	22
Table 119	– Behaviour of the outlet temperature following the increase of the water inlet temperature	22

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD ELECTRIC INSTANTANEOUS WATER HEATERS –
METHODS FOR MEASURING THE PERFORMANCE –****Part 2-1: Multifunctional electric instantaneous water 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 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) 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.

International Standard IEC 63159-2-1 has been prepared by subcommittee 59C: Electrical heating appliances for household and similar purposes, of IEC technical committee 59: Performance of household and similar electrical appliances.

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

Draft	Report on voting
59C/268/FDIS	59C/272/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. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

This International Standard is to be used in conjunction with IEC 63159-1:2021.

This standard supplements or modifies the corresponding clauses in IEC 63159-1. When a particular subclause of IEC 63159-1 is not mentioned in this standard, that subclause is applicable as far as reasonable. Where this standard states "addition", "modification" or "replacement", the relevant requirements, test specifications or explanatory matter in IEC 63159-1 should be adapted accordingly.

Subclauses or figures that are additional to those in IEC 63159-1 are numbered starting from 101. Additional annexes are lettered AA, BB, etc.

A list of all the parts in the IEC 63159 series, published under the general title *Household electric instantaneous water heaters – Methods for measuring the performance*, can be found on the IEC website.

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 in the data related to the specific document. At this date, the document will be

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

IEC STANDARD
PREVIEW
(standards.iteh.ai)

SIST EN IEC 63159-2-1:2022

<https://standards.iteh.ai/catalog/standards/sist/1e5a4075-1194-480f-9ff3-824cabfdc608/sist-en-iec-63159-2-1-2022>

HOUSEHOLD ELECTRIC INSTANTANEOUS WATER HEATERS – METHODS FOR MEASURING THE PERFORMANCE –

Part 2-1: Multifunctional electric instantaneous water heaters

1 Scope

This clause of IEC 63159-1:2021 is applicable with the following exception:

Addition:

This document applies to electrical instantaneous water heaters designed to operate as multifunctional appliances with an electric rated power > 2 kW.

This document specifies tests for the assessment of the performance.

2 Normative references

This clause of IEC 63159-1:2021 is applicable with the following exception:

Addition:

IEC 63159-1:2021, *Household electric instantaneous water heaters – Methods for measuring the performance – Part 1: General aspects*

3 Terms and definitions

This clause of IEC 63159-1 is applicable with the following exceptions:

Addition:

3.101

setpoint value

changeable value that is allocated to the appliance or the individual components thereof

3.102

pressure drop on activation of the heating capacity

pressure drop in the instantaneous water heater, at which the heating capacity is, and remains, activated

3.103

90 % method

stop point of the measurement when 90% of value is reached

Note 1 to entry: Usually, a physical value reaches a final (average) value in an asymptotic manner. To reach a valid measurement result, a stop point of the measurement has to be defined. The measurement is stopped when the value finally reaches 90 % of the difference between the (average) starting value and the (average) final value.

3.104

10 %/90 % method

range between the start and stop points