

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Household electric instantaneous water heaters – Methods for measuring the performance –
Part 2-2: Efficiency of single point of use electric instantaneous water heaters

Chaque-eau instantané électrodomestiques – Méthodes de mesure de
l'aptitude à la fonction –
Partie 2-2: Rendement des chauffe-eau instantanés électriques à un seul point
d'utilisation



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HOUSEHOLD ELECTRIC INSTANTANEOUS WATER HEATERS –
METHODS FOR MEASURING THE PERFORMANCE –****Part 2-2: Efficiency of single point of use electric
instantaneous water heaters**

FOREWORD

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International Standard IEC 63159-2-2 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/269/FDIS	59C/273/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.

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

Part 2-2: Efficiency of single point of use electric instantaneous water heaters

1 Scope

This clause of IEC 63159-1:2021 is applicable except as follows.

Addition:

This document applies to open outlet, single point-of-use, electric instantaneous water heaters intended for household or similar use, for showering purposes without downstream mixing.

This document only specifies tests for the assessment of energy efficiency.

This document does not apply to electrical instantaneous water heaters covered by other parts of this series of standards.

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2 Normative references (standards.iteh.ai)

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

<https://standards.iteh.ai/catalog/standards/sist/9cb52748-a043-4a9f-8fc5-cc208a946f74/iec-63159-2-2-2021>

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 63159-1:2021 is applicable.

4 General test conditions

This clause of IEC 63159-1:2021 is applicable except as follows.

4.3 General conditions

Addition:

4.3.101 Pressure, temperature, flow, and power conditions

Pressure, temperature, and flow measurements should be maintained during testing to the tolerance detailed in Table 1. Any deviations from these tolerances will result an invalid test. All tests shall be performed at maximum power setting.

4.4 Test setup

Replacement:

The appliance shall be fixed in accordance with the installation instructions, except that the shower hose shall be connected. Products covered by this document are only to be tested to the XS load pattern detailed in Annex A, Table A.1.

The measurement setup shall correspond to Annex B.

5 Energy efficiency

This clause of IEC 63159-1:2021 is applicable except as follows.

5.1 Test method

5.1.1 General

Addition:

It is allowable to decrease the time between draw offs in order to accelerate the load pattern detailed in Annex A, as long as it can be demonstrated that results are not affected.

Addition:

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5.1.1.101 Setpoints

The appliance shall be set to achieve minimum flow (\dot{V}) as specified in Annex A for all efficiency tests. This can be increased if the appliance is unable to operate continuously and the flow rate used recorded. This flow rate is used for all individual draw offs within the prescribed load pattern.

5.1.2 Static efficiency

Addition:

The loss adjustment for semiconductor power switches of open outlet electronic instantaneous water heaters is not applicable for this type of appliance.

5.1.3 Start up losses

Replacement:

The start up loss Q_{start_i} is the total energy in kWh that is consumed by the appliance between energizing the heating elements and the delivery of useable water temperature for each specific draw off i .

Q_{start_i} is measured using a Wh meter for the duration between the point at which the heater elements are energized and when the outlet water has achieved the minimum temperature for useable energy, T_m .

5.2.2 Daily energy demand

Modification:

smart = 0

Annex A (normative)

Load pattern

This annex of IEC 63159-1:2021 is applicable except as follows.

Addition:

Only the load pattern XS of Table A.1 shall be used.

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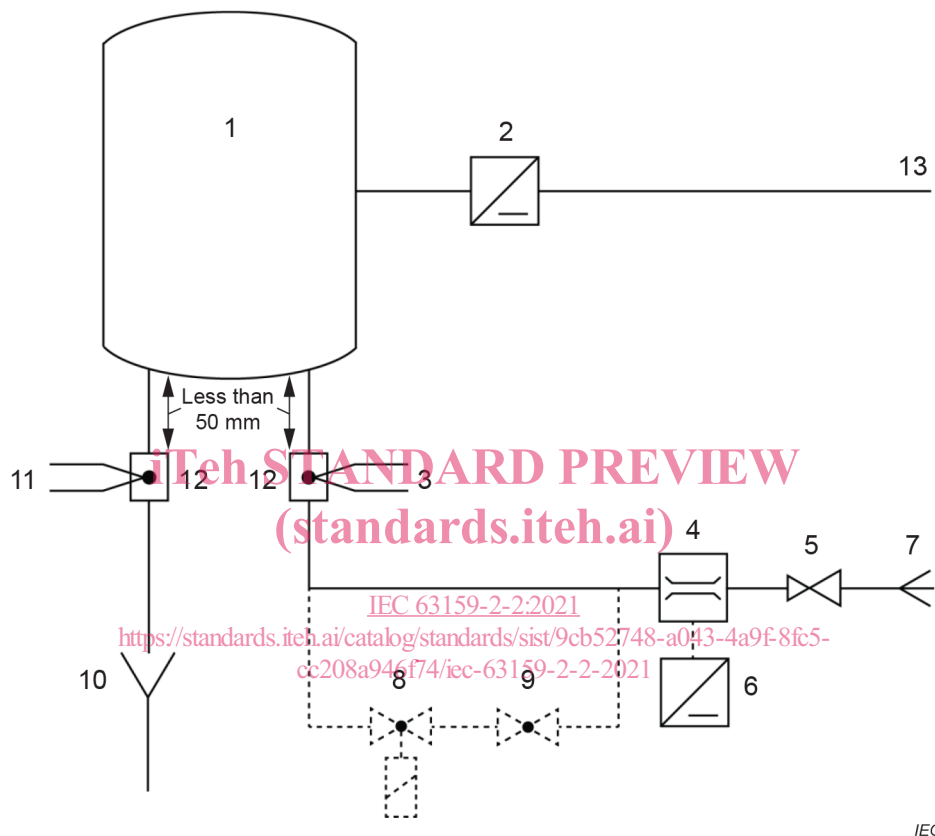
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Annex B (normative)

Test setup

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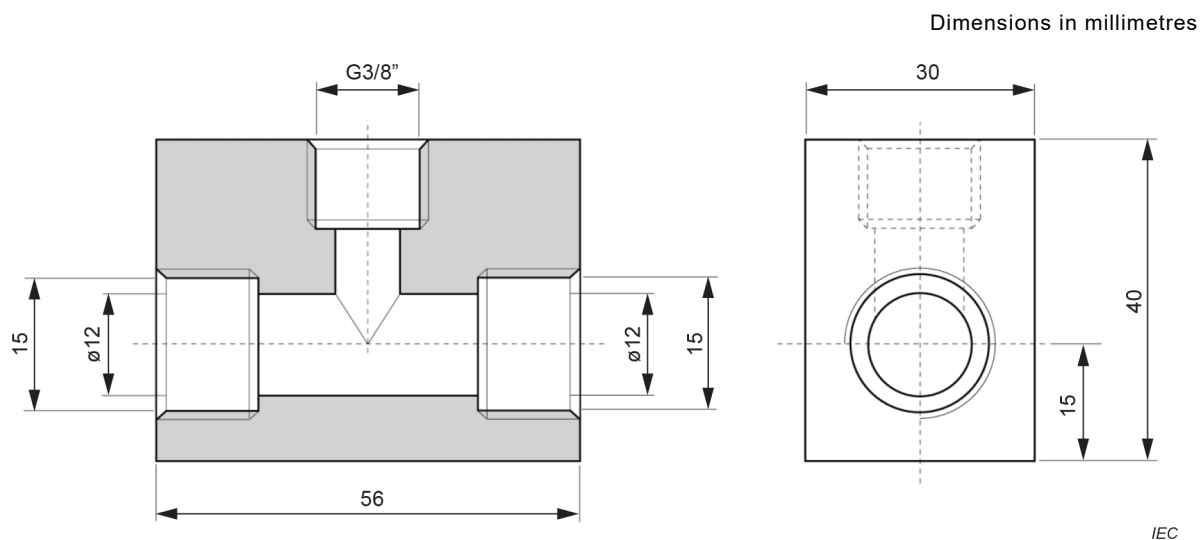
Replacement:



Key

1	appliance under test (installed without outlet fittings)	8	on/off flow control (optional)
2	power meter	9	flow control (optional)
3	inlet temperature sensor	10	open water outlet
4	flow meter	11	outlet temperature sensor
5	pressure reducing / regulating device	12	temperature sensor housing (see Figure B.3 and Figure B.4)
6	pressure measurement (optional)	13	electrical power connection
7	connection to the water distribution network		

Figure B.1 – Test setup for open-outlet instantaneous heater

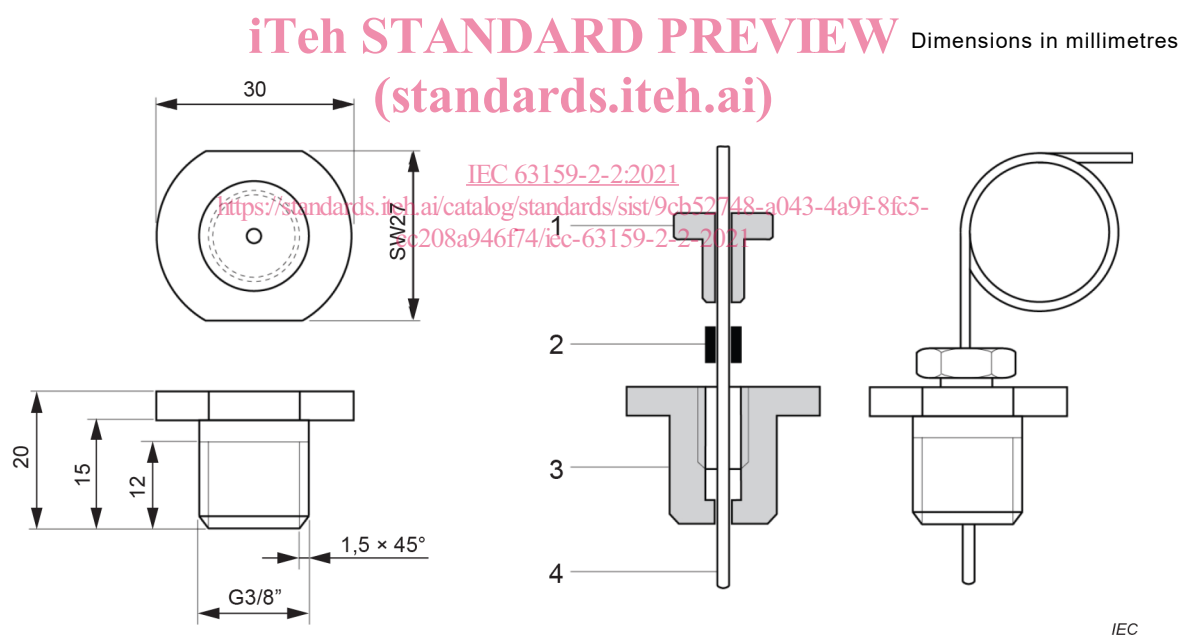


Material: P A66

Thread in accordance with DIN ISO 228-1

Dimension tolerances in accordance with ISO 2768-1

Figure B.2 – Test setup for open-outlet instantaneous heater



Material: P A66

Thread in accordance with DIN ISO 228-1

Key

- 1 thermocouple fitting
- 2 seal
- 3 connector
- 4 thermocouple

Figure B.3 – Example of thermocouple housing