



BSI Standards Publication

# Electric instantaneous water heaters

Part 2-2: Performance requirements —  
Single point of use electric instantaneous  
showers — Efficiency

**National foreword**

This British Standard is the UK implementation of EN 50193-2-2:2016.

The UK participation in its preparation was entrusted to Technical Committee CPL/59, Performance of household electrical appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Date	Text affected
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EUROPEAN STANDARD

**EN 50193-2-2**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2016

ICS 91.140.65

English Version

**Electric instantaneous water heaters - Part 2-2: Performance requirements - Single point of use electric instantaneous showers - Efficiency**

Chauffe-eau électriques instantanés - Partie 2-2 :  
Exigences d'aptitude à la fonction - Chauffe-eau  
instantanés de douches à un seul point d'utilisation -  
Efficacité.

Elektro-Durchfluss-Wassererwärmer - Teil 2-2:  
Anforderungen an die Gebrauchseigenschaften -  
Durchfluss-Wassererwärmer für eine einzelne Zapfstelle -  
Effizienz

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

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN 50193-2-2) has been prepared by CLC/TC 59X "Performance of household and similar electrical appliances".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) [2017-10-10]
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) [2019-10-10]

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.

For the relationship with EU Directive(s) see informative Annexes ZZA and ZZB, which are an integral part of this document.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

## 1 Scope

This clause of part 1 is applicable except as follows.

*Addition:*

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

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

## 2 Normative references

This clause of Part 1 is applicable.

## 3 Terms and definitions

This clause of Part 1 is applicable.

## 4 General test conditions

This clause of Part 1 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 testing should be performed at the rated power for the appliance (based on a rating at 230V/400V as applicable).

#### 4.4 Test Setup

*Replacement:*

The appliance shall be fixed in accordance with the installation instructions except that the shower hose shall not be connected. Products covered by this standard 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 Part 1 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*

#### **5.1.1.101 Set Points**

The appliance shall be set to achieve minimum flow ( $f$ ) 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 energised and when the outlet water has achieved the minimum temperature for useable energy,  $T_m$ .

#### **5.1.5 Determination of smart control compliance**

Not applicable.

#### **5.2.2 Daily energy demand**

Modification:

$smart = 0$

## **Annex A** (normative)

### **Load pattern**

This annex of part 1 is applicable except as follows.

#### **Table A.1**

*Addition:*

Only load pattern XS shall be used

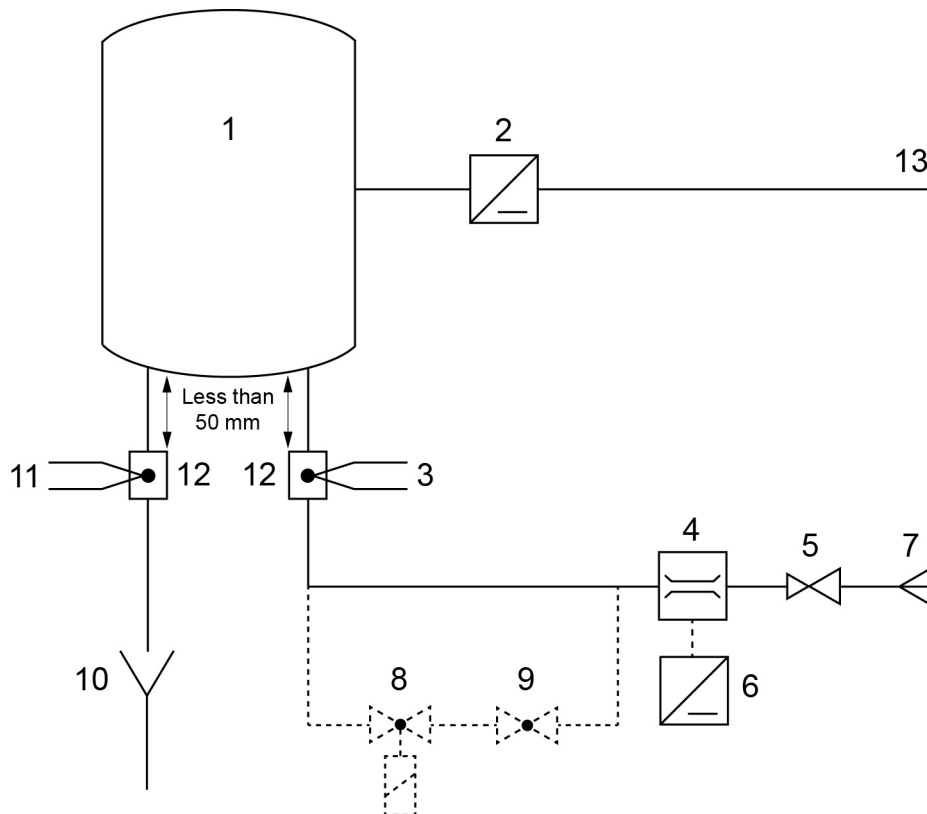


## Annex B (normative)

### Test Set Up

This annex of part 1 is applicable except as follows.

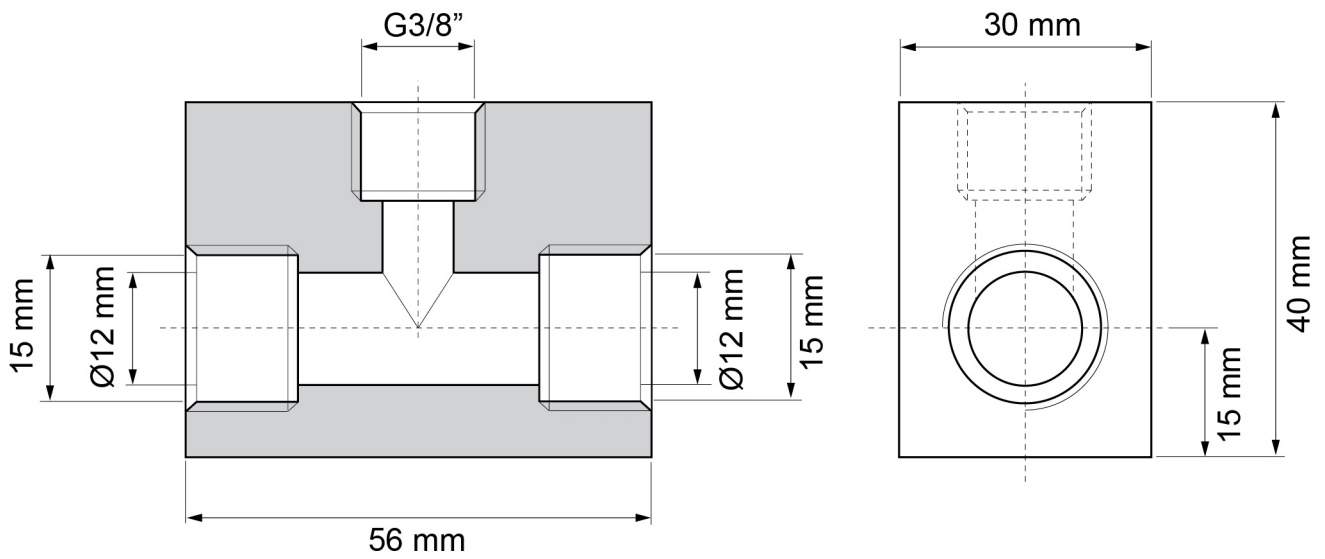
*Replacement:*



#### Key

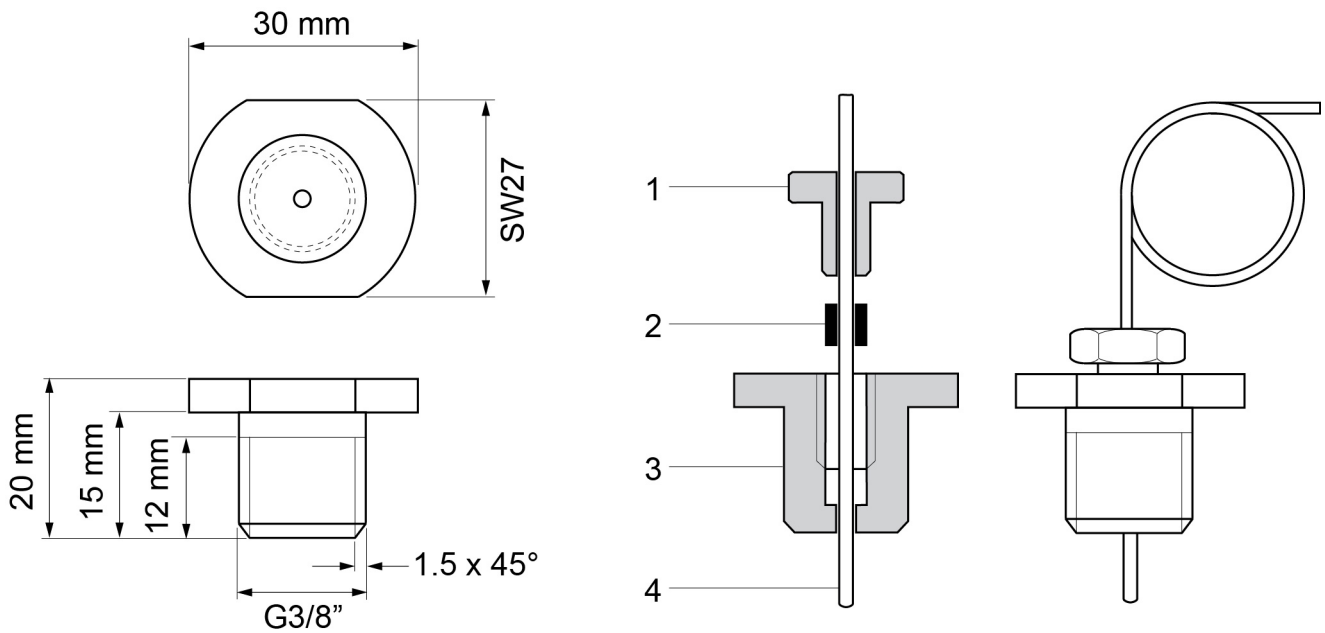
1	Appliance under test (installed without outlet fittings)	8	On/Off Flow control (optional)
2	Power meter	9	Flow control (optional)
3	Inlet temperature sensor	10	Open water outlet
4	Flow meter	11	Outlet temperature sensor
5	Pressure reducing / regulating device	12	Temperature sensor housing (see Figures 3 and 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 according to ISO 2768-1

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



Material: P A66  
 Thread in accordance with DIN ISO 228-1

- 1 Thermocouple fitting
- 2 Seal
- 3 Connector
- 4 Thermocouple

**Figure B.3 — Example of thermocouple housing**

## Annex ZZA (informative)

### Relationship between this European Standard and the energy labelling requirements of Commission Delegated Regulation (EU) No 812/2013 aimed to be covered

This European standard has been prepared under a Commission's standardization request, M/534 C(2015) 2625 final to provide one voluntary means of conforming to the energy labelling requirements of Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device, OJ L239, 6.9.2013.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding energy labelling requirements of that Regulation and associated EFTA Regulations.

**Table ZZA.1 — Correspondence between this European Standard and Commission Delegated Regulation (EU) No 812/2013 of 18 February 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of water heaters, hot water storage tanks and packages of water heater and solar device, OJ L239, 6.9.2013 and Commission's standardization request, M/534 C(2015) 2625 final**

Energy labelling requirements of Regulation (EU) No 812/2013, OJ L239, 6.9.2013	Clause(s) / subclause(s) of this EN	Remarks / Notes
Daily electricity consumption	5.2.2 Daily energy demand	
Annual electricity consumption	5.2.5 Annual electricity consumption	
Water heater energy efficiency	5.2.4 Energy-efficiency	

**WARNING 1:** Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

**WARNING 2:** Other Union legislation may be applicable to the products falling within the scope of this standard.

## Annex ZZB (informative)

### Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 814/2013 aimed to be covered

This European Standard has been prepared under a Commission's standardization request, M/534 C(2015) 2625 final to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks, OJ L293, 6.9.2013.

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**Table ZZB.1 — Correspondence between this European Standard and Commission Regulation (EU) No 814/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water heaters and hot water storage tanks, OJ L293, 6.9.2013 and Commission's standardization request, M/534 C(2015) 2625 final**

Ecodesign requirements of Regulation (EU) No 814/2013, OJ L293, 6.9.2013	Clause(s) / subclause(s) of this EN	Remarks / Notes
Daily electricity consumption	5.2.2 Daily energy demand	
Water heater efficiency	5.2.4 Energy-efficiency	

**WARNING 1** — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

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## Bibliography

This annex of Part 1 is applicable.





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### BSI Group Headquarters

389 Chiswick High Road London W4 4AL UK