

BS EN 12309-5:2014



BSI Standards Publication

Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW

Part 5: Requirements

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National foreword

This British Standard is the UK implementation of EN 12309-5:2014. Together with BS EN 12309-1:2014, BS EN 12309-3:2014, BS EN 12309-4:2014, BS EN 12309-6:2014 and BS EN 12309-7:2014, it supersedes BS EN 12309-2:2000, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GSE/37, Gas fired sorption and laundering 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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English Version

Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW - Part 5: Requirements

Appareils à sorption fonctionnant au gaz pour le chauffage et/ou le refroidissement de débit calorifique sur PCI inférieur ou égal à 70 kW - Partie 5: Exigences

Gasbefeuerte Sorptions-Geräte für Heizung und/oder Kühlung mit einer Nennwärmebelastung nicht über 70 kW - Teil 5: Anforderungen

This European Standard was approved by CEN on 18 October 2014.

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Foreword

This document (EN 12309-5:2014) has been prepared by Technical Committee CEN/TC 299 “Gas-fired sorption appliances, indirect fired sorption appliances, gas-fired endothermic engine heat pumps and domestic gas-fired washing and drying appliances”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

This document supersedes EN 12309-2:2000.

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

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

For relationship with EU Directive(s), see informative Annex ZA, Annex ZB and Annex ZC, which are integral parts of this document.

This standard comprises the following parts under the general title, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW*:

- *Part 1: Terms and definitions;*
- *Part 2: Safety;*
- *Part 3: Test conditions;*
- *Part 4: Test methods;*
- *Part 5: Requirements;*
- *Part 6: Calculation of seasonal performances;*
- *Part 7: Specific provisions for hybrid appliances;*
- *Part 8: Environmental aspects.*

EN 12309-1 and EN 12309-2 supersede EN 12309-1:1999, whereas EN 12309-1, EN 12309-3, EN 12309-4, EN 12309-5, EN 12309-6, and EN 12309-7 supersede EN 12309-2:2000.

EN 12309-1, EN 12309-2, EN 12309-3, EN 12309-4, EN 12309-5, EN 12309-6, and EN 12309-7 have been prepared to address the essential requirements of the European Directive 2009/142/EC relating to appliances burning gaseous fuels (see Annex ZA of prEN 12309-2:2013 for safety aspects and Annex ZA of EN 12309-5:2014 for rational use of energy aspects).

These documents are linked to the Energy Related Products Directive (2009/125/EC) in terms of tests conditions, tests methods and seasonal performances calculation methods under Mandate M/495 (see EN 12309-3:2014, Annex ZA; EN 12309-4:2014, Annex ZA; EN 12309-6:2014, Annex ZA and EN 12309-7:2014, Annex ZA and prEN 12309-2:2013, Annex ZB and EN 12309-5:2014, Annex ZB).

These documents will be reviewed whenever new mandates could apply.

EN 12309-8 (“Environmental aspects”) deals with the incorporation of the Resolution BT 27/2008 regarding CEN approach on addressing environmental issues in product and service standards.

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1 Scope

1.1 Scope of EN 12309

Appliances covered by this standard include one or a combination of the following:

- gas-fired sorption chiller;
- gas-fired sorption chiller/heater;
- gas-fired sorption heat pump.

This European Standard applies to appliances designed to be used for space heating or cooling or refrigeration with or without heat recovery.

This European Standard applies to appliances having flue gas systems of type B and type C (according to CEN/TR 1749) and to appliances designed for outdoor installations. EN 12309 does not apply to air conditioners, it only applies to appliances having:

- integral burners under the control of fully automatic burner control systems,
- closed system refrigerant circuits in which the refrigerant does not come into direct contact with the water or air to be cooled or heated,
- mechanical means to assist transportation of the combustion air and/or the flue gas.

The above appliances can have one or more primary or secondary functions (i.e. heat recovery - see definitions in EN 12309-1:2014).

In the case of packaged units (consisting of several parts), this European Standard applies only to those designed and supplied as a complete package.

The appliances having their condenser cooled by air and by the evaporation of external additional water are not covered by EN 12309.

Installations used for heating and/or cooling of industrial processes are not within the scope of EN 12309.

All the symbols given in this text should be used regardless of the language used.

1.2 Scope of this Part 5 of EN 12309

This part of EN 12309 specifies the requirements for gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW.

This part of EN 12309 deals particularly with the requirements relating to the declaration of capacity and energy efficiency performance.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12309-1:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 1: Terms and definitions*

prEN 12309-2:2013¹ *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 2: Safety*

EN 12309-3:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 3: Test conditions*

EN 12309-4:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 4: Test methods*

EN 12309-6:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 6: Calculation of seasonal performances*

EN 12309-7:2014, *Gas-fired sorption appliances for heating and/or cooling with a net heat input not exceeding 70 kW — Part 7: Specific provisions for hybrid appliances*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12309-1:2014 apply.

When *GUE* (Gas Utilization Efficiency) or *SPER* (Seasonal Primary Energy Ratio) values are stated according to Clause 4 (Requirements) and to Clause 5 (Marking and instructions), these values need to be expressed in percentage terms.

4 Requirements

4.1 Cooling capacity rating and energy performance

4.1.1 Primary functions

The rated cooling capacity corresponding to Standard Rating conditions given in EN 12309-3:2014, Table 3, together with the gas utilization efficiency under the same conditions shall be specified in the instructions of the appliance. When measured under the appropriate test conditions given in EN 12309-3:2014, and in accordance with the methods of test described in EN 12309-4:2014, it shall be verified that the rated cooling capacity and the gas utilization efficiency are not less than those stated in the instructions.

If the rated cooling capacities or gas utilization efficiency corresponding to application rating conditions given in EN 12309-3:2014, Table 3 are specified in the instructions of the appliance, these shall also be verified. When measured under the appropriate test conditions given in EN 12309-3:2014, and in accordance with the methods of test described in EN 12309-4:2014, it shall be verified that the corresponding rated cooling capacity and, if applicable, the gas utilization efficiency are not less than those stated in the instructions.

If a rated cooling capacity or gas utilization efficiency for the primary function which relates to conditions other than those given in EN 12309-3:2014 is specified in the instructions of the appliance, the claim(s) shall be verified under the conditions specified in the instructions of the appliance.

4.1.2 Secondary functions

If a rated heating capacity is specified in the instructions of the appliance, the corresponding gas utilization efficiency and the conditions (water temperature and flow rate) under which the claims are made shall also be stated. It shall be verified under these conditions and under EN 12309-4:2014 appropriate test procedure that these claims are not less than those stated in the instructions.

If the secondary function is heat recovery, the rated heat recovery capacity specified shall correspond to the appropriate test conditions given in EN 12309-3:2014, Table 4. When measured under the appropriate test

¹⁾ This part of EN 12309 is currently being revised.

conditions given in EN 12309-3:2014 and in accordance with the methods of test described in EN 12309-4:2014, it shall be verified that the rated heat recovery capacity is not less than that stated in the instructions.

4.1.3 Efficiency requirements

When measured under the appropriate test conditions given in EN 12309-3:2014 and in accordance with the methods of test described in EN 12309-4:2014, it shall be verified that the gas utilization efficiency shall be:

- $GUE_{NCV} > 0.55$ when measured at Standard Rating Condition, where standard rating condition foresee water output temperature equal or greater than 7 °C;
- $GUE_{NCV} > 0.45$ when measured at standard sating condition, where standard rating condition foresee water output temperature lower than 7 °C.

4.2 Heating capacity rating and energy performance

4.2.1 Primary functions

The rated heating capacity corresponding to test conditions given in EN 12309-3:2014, Table 5 or Table 6, or given in EN 12309-7:2014 for hybrid appliances, together with the gas utilization efficiency under the same conditions shall be specified in the instructions of the appliance. When measured under the appropriate test conditions given in EN 12309-3:2014 or given in EN 12309-7:2014 for hybrid appliances, and in accordance with the method of test described in EN 12309-4:2014, it shall be verified that the rated heating capacity and the gas utilization efficiency are not less than those stated in the instructions.

The *SPER* as calculated as per EN 12309-6:2014 (or as per EN 12309-7:2014 for hybrid appliances) shall be specified in the instructions of the appliance. When measured under the appropriate test conditions given in EN 12309-6:2014 (or given in EN 12309-7:2014 for hybrid appliances) it shall be verified that the *SPER* is not less than that stated in the instructions. When *SPER* is calculated on the basis of a water source temperature different from 10 °C or ground (brine) temperature different from 0 °C, *SPER* shall be stated jointly with source (water or brine) temperature used for *SPER* calculation.

If the rated heating capacities or gas utilization efficiency corresponding to application rating conditions given in EN 12309-3:2014, Table 5 or Table 6 are specified in the instructions of the appliance, these shall also be verified. When measured under the appropriate test conditions given in EN 12309-3:2014, and in accordance with the methods of test in EN 12309-4:2014, it shall be verified that the corresponding rated heating capacity and, if applicable, the gas utilization efficiency are not less than those stated in the instructions.

If a rated heating capacity or *GUE* for the primary function which relates to conditions other than those given in this European Standard is specified in the instructions of the appliance, the claim(s) shall be verified under the conditions specified in the instructions of the appliance.

4.2.2 Secondary functions

If a rated cooling capacity is specified in the instructions of the appliance, the corresponding *GUE* and the conditions (water/brine temperature and flow rate) under which the claims are made shall also be stated. It shall be verified under these conditions and the appropriate test procedure as defined in EN 12309-4:2014 that these claims are not less than those stated in the instructions.

4.2.3 Efficiency requirements

When measured under the appropriate test conditions given in EN 12309-3:2014 and in accordance with the methods of test described in EN 12309-4:2014 or described in EN 12309-7:2014 for hybrid appliances, it shall be verified that the gas utilization efficiency for all appliances, except hybrid appliances, shall be:

- $GUE_{hNCV} > 1.15$ (A7W35) for air sourced appliances

- $GUE_{h,NCV} > 1.15$ (W10W35) for water sourced appliances
- $GUE_{h,NCV} > 1.15$ (B0W35) for ground sourced appliances

For air, ground water, ground heat and solar sourced hybrid heating appliances shall be:

- $GUE_{h,NCV} > 1.15$ for the low temperature application (W35) at the standard rating test conditions of 30 % part load defined in Table 10 of EN 12309-7:2014

5 Marking and instructions

5.1 Data plate

In addition to the information required in prEN 12309-2:2013, the data plate shall include the following information according to the appliance denomination:

- for air or water cooled chillers and chillers/heaters, the rated cooling capacity of the primary function, expressed in kilowatt, corresponding to the standard rating condition given in EN 12309-3:2014, Table 3;
- for all types of heat pumps (air, water/brine) the rated heating capacity of the primary function expressed in kilowatt corresponding to the standard rating condition given in EN 12309-3:2014 (or given in EN 12309-7:2014 for hybrid appliances) the type of output temperature level (low medium, high and very high), and the *SPER* as given in EN 12309-6:2014 (or EN 12309-7:2014 for hybrid appliances) at least for the *average climate* of the above mentioned primary function. When *SPER* is calculated on the basis of a water source temperature different from 10°C or ground (brine) temperature different from 0 °C, *SPER* shall be stated jointly with source (water or brine) temperature used for *SPER* calculation.

In case of secondary functions being provided, then the corresponding rated capacities shall be stated.

5.2 Technical instructions for installation and adjustment

5.2.1 General

In addition to the information required in prEN 12309-2:2013, the technical instructions for installation and adjustment shall include the information given in 4.1.1; 4.1.2; 4.2.1 and 4.2.2 as appropriate.

5.2.2 Cooling mode

If the appliance is capable of operating in cooling mode, the instructions shall include the following:

- for air or water cooled chillers and chillers/heaters, the rated cooling capacity of the primary function, expressed in kilowatt, corresponding to the standard rating condition given in EN 12309-3:2014, Table 3;
- the gas utilization efficiency ($GUE_{c,NCV}$) of the above-mentioned primary functions under the same standard rating conditions;

NOTE Optionally the gas utilization efficiency ($GUE_{c,GCV}$) according to GCV of fuel can be stated, provided it is clearly specified that is measured on GCV.

If a cooling capacity or GUE_c in relation to the primary function for conditions other than those given EN 12309-3:2014 is stated, these conditions (temperatures, flow rates, pressure differences, etc.) shall be specified in the instructions.

If a cooling capacity or GUE_c in relation to the secondary function, which is not heat recovery is specified, the corresponding GUE_c and the conditions (temperatures, flow rates, pressure differences, etc.) under which this claim(s) is said to be valid shall be stated in the instructions.

5.2.3 Heating mode

If the appliance is capable of operating in heating mode, the instructions shall include the following:

- rated heating capacity of the primary function expressed in kilowatt corresponding to the standard rating conditions given in EN 12309-3:2014 or given in EN 12309-7:2014 for hybrid appliances and the corresponding type of output temperature level (low, medium, high and very high),
- the GUE_h of the above-mentioned primary function under the same standard rating conditions (i.e. $GUE_{h,NCV}$) (or given in EN 12309-7:2014 for hybrid appliances);

NOTE Optionally the gas utilization efficiency ($GUE_{h,GCV}$) according to GCV of fuel can be stated, provided it is clearly specified that is measured on GCV.

- the $SPER$ as given in EN 12309-6:2014 or given in EN 12309-7:2014 for hybrid appliances at least for the average climate of the above mentioned primary function;
- sound power level as given in EN 12309-4:2014.

If the heating capacity or GUE_h in relation to the primary function for conditions other than those given in EN 12309-3:2014 or given in EN 12309-7:2014 for hybrid appliances is specified, the corresponding GUE_h the corresponding output temperature level (low, medium, high or very high) and the conditions under which this claim(s) is said to be valid (temperatures, flow rates, pressure differences, etc.) shall be stated in the instructions.

If the heating capacity or gas utilization efficiency in relation to the secondary function is specified, the corresponding GUE and the conditions (temperatures, flow rates, pressure differences, etc.) under which this claim(s) is said to be valid shall be stated in the instructions.

Annex ZA (informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2009/142/EC relating to appliances burning gaseous fuels (Gas Appliances Directive)

This European Standard has been prepared under a mandate given to CEN by the European Commission to provide a means of conforming to Essential Requirements of the New Approach Directive 2009/142/EC relating to appliances burning gaseous fuels (Gas Appliances Directive).

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Directive 2009/142/EC

Clause(s)/sub-clause(s) of this EN	Essential Requirements (ERs) of Directive 2009/142/EC	Qualifying remarks/Notes
4.1.3 4.2.3	3.5	Rational use of energy

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Annex ZB (informative)

Relationship between this European Standard and the requirements of Commission Regulation (EC) No 813/2013

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to requirements of *Commission Regulation (EC) No 813/2013 of 6 September 2013 implementing Directive 2005/32/EC²⁾ /2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters.*

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

Table ZB.1 — Correspondence between this European Standard and Commission Regulation (EC) No 813/2013

Clauses and subclauses of this EN	Requirements of Commission Regulation (EC) No 813/2013	Qualifying remarks/Notes
4.2.1	Annex II.5 (a), (b) and (c)	

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

²⁾ The Directive was replaced by the Directive 2009/125/EC.

Annex ZC (informative)

Relationship between this European Standard and the requirements of Commission Regulation (EC) No 811/2013

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to requirements of *Commission Regulation (EC) No 811/2013 of 6 September 2013 implementing Directive 2005/32/EC³⁾ / 2009/125/EC of the European Parliament and of the Council with regard to energy labelling of space heaters, combination heaters, packages of space heater, temperature control and solar device and packages of combination heater, temperature control and solar device.*

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

Table ZC.1 — Correspondence between this European Standard and Commission Regulation (EC) No 811/2013

Clauses and subclauses of this EN	Requirements of Commission Regulation (EC) No 811/2013	Qualifying remarks/Notes
Not applicable	Article 3, 1(a), Annex II, 1	Energy efficiency classes
Not applicable	Article 3, 1(a), Annex II, 2	Water heating energy classes
5.2.3	Article 3, 1(a), Annex III and IV	Sound power level
4.2.1	Article 3, 1(a), Annex III, 1.1 and Annex III, 3.	Energy label for space heater
Not applicable	Article 3, 1(b), Annex IV, 1 and Annex IV, 5.	Product fiche for space heater
5.2.3	Article 3, 1(c), Annex V, 1.	Technical documentation for space heater
Not applicable	Article 3, 2(a), Annex III, 2.1 and Annex III, 4.	Energy label for combination heater
Not applicable	Article 3, 2(b), Annex IV, 2 and Annex IV, 6.	Product fiche for combination space heater
Not applicable	Article 3, 2(c), Annex V, 2	Technical documentation for combination heater

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

³⁾ The Directive was replaced by the Directive 2009/125/EC.

Bibliography

- [1] CEN/TR 1749, *European scheme for the classification of gas appliances according to the method of evacuation of the combustion products (types)*

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