BRITISH STANDARD

BS EN
14438:2006

Gas-fired insets for heating more than one room

The European Standard EN 14438:2006 has the status of a British Standard

ICS 97.100.20

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 14438:2006.

The UK participation in its preparation was entrusted to Technical Committee GSE/36, Independent gas-fired space heaters.

A list of organizations represented on GSE/36 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.

Compliance with a British Standard cannot confer immunity from legal obligations.

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English Version

Gas-fired insets for heating more than one room

Foyers utilisant les combustibles gazeux pour le chauffage de plusieurs pièces

Heizeinsätze für gasförmige Brennstoffe zur Mehrraumbeheizung

This European Standard was approved by CEN on 25 November 2006.

CEN 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 Central Secretariat or to any CEN 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 CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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Foreword

This document (EN 14438:2006) has been prepared by Technical Committee CEN/TC 62 “Independent gas-fired space heaters”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by June 2007, and conflicting national standards shall be withdrawn at the latest by June 2007.

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, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

1 Scope

This European Standard specifies the requirements and test methods for the construction, safety, marking and rational use of energy of gas-fired insets for heating more than one room that are intended to be built into a casing made from brickwork or similar material.

This European Standard is intended to be used in conjunction with EN 613:2000.

This European Standard is applicable to type B_{11BS} insets burning gas:

— that incorporate an atmospheric burner;

— that are installed directly to an open flue or to a device to evacuate the products of combustion;

— that have a nominal heat input not exceeding 20 kW (based on the net calorific value).

In addition, this European Standard is also applicable to insets for heating more than one room which have a live fuel effect.

This European Standard is not applicable to:

— open fronted appliances as specified in EN 13278;

— decorative fuel effect appliances as specified in EN 509;

— convection heating appliances as specified in EN 613;

— catalytic combustion appliances;

— appliances in which the supply of combustion air and/or evacuation of products of combustion is achieved by mechanical means as specified in EN 1266;

— warm air heaters (which are subject of CEN/TC 180).

This European Standard is only applicable to insets which are intended to be type tested.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 125, *Flame supervision devices for gas-burning appliances — Thermo-electric flame supervision devices*

EN 298, *Automatic gas burner control systems for gas burners and gas burning appliances with or without fans*

EN 613:2000, *Independent gas-fired convection heaters*

EN 50165, *Electrical equipment of non-electric heating appliances for household and similar purposes — Safety requirements*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 613:2000 and the following apply.

3.1
heating inset
built-in convection heater, which is designed to heat more than one room (see Figure 1)

3.2
warm air chamber
chamber in which the heating inset is installed

4 Classification of appliances

Clause 4 of EN 613:2000 applies.

5 Constructional requirements

The constructional requirements given in Clause 5 of EN 613:2000 apply with the following modifications:

5.1 General

5.1.6.3 Built-in insets

Heating insets shall be delivered fully assembled for installation.

5.1.7 Supply of combustion air and evacuation of combustion products

5.1.7.1 General

The inset shall be of the type B_{11BS}. It shall include the whole of the combustion circuit, from the entry of the combustion air to the inset to the combustion products outlet of the inset.

5.1.7.2 Supply of combustion air

Combustion air inlets shall have fixed openings and shall be designed such that the requirements concerning combustion and flame stability are met.

5.1.7.3 Draught diverter

Heating insets shall have a draught diverter, which is integral part of the inset.

The draught diverter shall be constructed such that in case of spillage the combustion gases shall go directly into the room and not into the warm air chamber.

The openings of the draught diverter shall not be adjustable.

5.1.8 Electrical equipment

The inset shall be so designed and constructed as to obviate hazards of an electrical origin. The inset shall comply with the requirements of EN 50165 which cover such hazards.

If the inset is fitted with electronic components or electronic systems providing a safety function, these shall comply with the relevant requirements of EN 298 with regard to electromagnetic compatibility immunity levels.

If the manufacturer specifies the nature of the electrical protection of the inset on the data plate, this specification shall comply with EN 60529 to give the degree of personal protection against contact with dangerous electrical components.

5.2.5 Flame supervision systems

5.2.5.1 General

An inset shall have a flame supervision device. It shall control the gas supply to the main burner and to any ignition burner, if fitted.

A flame supervision device shall be securely located in relation to every component with which it is designed to operate.

In the event of failure of the means of sensing, the inset shall be safe.

5.2.5.2 Insets with thermoelectric safety devices

Heat sensitive flame supervision devices of the thermoelectric type shall comply with EN 125.

5.2.5.3 Insets with automatic burner systems

If an inset is fitted with an automatic burner control system, it shall comply with EN 298.

The manufacturer shall specify the safety time (see 6.10.2.2 of EN 613:2000). For insets above 10 kW, the safety time shall not be more than 5 s, and for those up to and including 10 kW, the safety time shall not be more than 10 s.

NOTE The safety times have been limited because this inset is installed within a secondary enclosure.

Upon flame failure during the running condition the flame supervision device shall cause non-volatile lock-out, except in the case of insets with direct ignition of the main burner, in which case:

a) spark restoration within 1 s is allowable, or

b) a single restart attempt is allowed within 10 s.

In the event that re-ignition is unsuccessful during either of these periods non-volatile lock-out shall occur.

The operation of push buttons, switches etc., incorrectly or out of sequence shall not adversely affect the safety of an automatic burner control system.

5.2.7 Automatic burner control system

This subclause is covered by the final paragraph of 5.2.5.3 above.

5.2.10 Manually operated devices

This subclause is covered by 5.2.5.3 above.

5.4 Flame supervision systems

This subclause is covered by 5.2.5 above.

6 Operational requirements

The operational requirements given in Clause 6 of EN 613:2000 apply with the following modifications:

6.4.3 Temperature of floor

The inset manufacturer shall provide in his installation instructions the necessary information for either insulating the walls and/or floors or indicating the required clearance distances to ensure that the temperature of any adjacent walls and/or floors constructed of non-combustible or combustible materials comply with the following requirements.

6.4.3.1 Insets to be installed on/against non-combustible surfaces

For insets intended to be installed in accordance with the inset manufacturer's installation instructions on, or against, non-combustible surfaces, when tested as described in 7.4.3, the temperature at any user touchable point of the floor on which an inset is to be placed shall not exceed the ambient temperature by more than 80 K.

6.4.3.2 Insets to be installed on/against combustible surfaces

For insets intended to be installed in accordance with the inset manufacturer's installation instructions on, or against, combustible surfaces, when tested as described in 7.4.3, the temperature at any point of any floor on which an inset is to be placed, shall not exceed the ambient temperature by more than 60 K.

6.9 Spillage monitoring system

Only 6.9.2 of EN 613:2000 applies.

6.11 Efficiency

When the inset is tested as described in 7.11, the minimum net efficiency obtained (see 7.11.2 of EN 613:2000) with the inset operating at its nominal heat input shall be 89 %.

7 Test methods

The test methods given in Clause 7 of EN 613:2000 apply with the following modifications:

7.1.5.3 Test installation

The appliance shall be installed in accordance with the manufacturer's instructions without installing it into the warm air chamber (the requirements of 8.2.2.2 have not to be taken into account).

7.4 Temperature of various parts of the inset

For the tests according to 7.4.1 to 7.4.3 the inset is installed according to the manufacturer's instructions onto a test rig including all convection air ducts; the heat-resistant casing is replaced by a suitable heat insulation (see Figures 2 to 6). If the manufacturer requires a certain heat insulation or safety distances to combustible parts of floors or walls, these specifications shall be respected.

The test rig consists of a plywood board with a thermal conductivity of 0,15 W/m·K and their internal surfaces coated with matt black paint (see Figures 2 to 6). Thermocouples are incorporated into each panel (sides and hearth) at the centre of squares of side 100 mm (see Figure 5); these thermocouples are situated in the test panels according to Figure 6.

The distance between the back and side surfaces and test panels are the minimum distances specified by the manufacturer or, where appropriate, that distance created by fixing to the wall. The side panel is placed at the side of the inset where the temperatures are the highest.

All measurements are taken when the difference between the surface temperature and the ambient temperature is constant.

7.4.3 Temperature of floor and walls

For an inset which is intended to be installed on a combustible surface, the manufacturer should indicate in the installation instructions the nature of the effective protection to be applied between the inset and the floor, shelf or walls. This protection shall be supplied to the test laboratory by the manufacturer.

The inset is adjusted to nominal heat input according to 7.1.3.2 of EN 613:2000 using a reference gas and is operated until thermal equilibrium is achieved.

The test is repeated with the inset fan, if any, inoperative.

7.9 Spillage monitoring system

The test is carried out according to 7.9.1 and 7.9.3 of EN 613:2000.

7.11 Efficiency

The test is carried out according to 7.11 of EN 613:2000 with the following modification:

The test rig as described in 7.4 is used.

For type B_{11BS} insets a sample of the products of combustion and the measurement of combustion gases temperature is taken 2*D* downstream the flue socket (see Figure 7) at a pressure of 10 Pa with a probe according to Figure 8.

8 Marking and instructions

8.1 Marking

The marking requirements given in 8.1 of EN 613:2000 apply.

8.2 Instructions

The instruction requirements given in 8.2 of EN 613:2000 apply with the following modifications:

8.2.2 Technical instructions for installation and adjustment

8.2.2.1 Issues concerning installation and adjustment of the inset in particular

The following statement shall be included:

"Before installation, ensure that the local distribution conditions (identification of the type of gas and pressure) and the adjustment of the inset are compatible".

In addition to the information specified in 8.1.1 of EN 613:2000, the technical instructions may include information indicating, where appropriate, that the inset has been certified for use in countries other than those stated on the inset[1)]. If such information is given, the instructions shall include a warning that modification of the inset and its method of installation are essential to use the inset safely and correctly in any of these additional countries. This warning shall be repeated in the official language(s) of each of these countries. The instructions shall indicate how to obtain the information, instructions and parts necessary for safe and correct use in the countries concerned.

The technical instructions for installation and adjustment, intended for the installer, shall be available with the inset and shall cover the following:

— the method of connection and the installation regulations in the country where the inset is to be installed (if such regulations exist); also the flue and ventilation dimensions shall be given for the purposes of installation in those countries where there are no appropriate regulations;

— the fixing of the inset;

— the gas rate in m^3/h in relation to the gas used;

— for an inset with an adjustable pressure governor, the setting pressure as measured upstream of the burner but downstream of any adjuster, in relation to the gas family or group used;

— a declaration by the manufacturer of area(s) to be considered as a working surface;

— minimum distances between the inset and any walls and/or shelves, if applicable;

— any necessary precautions to be taken to avoid over-heating of the floor, shelf, walls, or else a statement to use non-combustible materials for the floor, shelf or wall close to the inset.

The instructions shall provide the following:

— all information on the operations and adjustments to be carried out when converting from one gas to another, and the injector markings for each gas that may be used;

— necessary instructions for inspecting the flue;

— description of the performance and installation characteristics particular to the inset, and information necessary for commissioning and maintenance.

[1)] Indirect countries of destination.

For insets which can only be installed on a gas installation with a governed meter, the instructions shall state the following:

"This appliance is intended for use on a gas installation with a governed meter."

The instructions for the spillage monitoring system shall:

a) warn that the system shall not be adjusted by the installer;

b) warn that the spillage monitoring system shall not be put out of operation;

c) warn that, when the spillage monitoring system or any of its parts is exchanged, only original manufacturer's parts shall be used.

8.2.2.2 Issues concerning the installation of the inset into the warm air chamber

— distances between the surface of the heating body and the wall;

— information on distances - between heating inset and floor of the warm air chamber, between heating inset and top of the warm air chamber and between exhaust pipe and the top of the warm air chamber;

— information on protection of walls made of combustible components, fitted furniture (as well as furniture reverse the wall) by using heat insulation (insulation materials, thickness of the insulation layer, radiant heat protection shields and necessary distances);

— statements on the necessary free cross-section of the warm air chamber;

— statements on the necessary free cross-section of the convection air outlets;

— statements on the minimum necessary cross-section of convection air outlets, which shall not be blocked;

— statements on the necessary free cross-section of the circulating air;

— reference to the stability of the heating inset;

— reference to the supply of combustion air;

— reference to the installation of gas-pipes in the warm air chamber;

— information on the necessary free cross-sector in the front door, so that the combustion air can flow freely, the heat is being evacuated sufficiently and in case of spillage of the draught diverter the flue gases can immediately escape from the recess;

— reference to the installation of electric cables in the warm air chamber if appropriate statements concerning the evacuation of combustion products - e.g. the fact that additional heat-exchangers in the flue gas system are not allowed, the exhaust pipe laid to the chimney has to be as short as possible and has to be installed with acclivity toward the chimney.

8.2.3 Instructions for use and maintenance

Instructions for use and maintenance shall be supplied with the inset.

These instructions, which are intended for the user, shall provide all the necessary information for the safe and sensible use and maintenance of the inset in clear and simple terms. They shall be separate or easily separable from the installation instructions. Wherever necessary, diagrams and/or photographs shall augment the text.

The instructions shall also stress that a qualified installer is required to install the inset, and, where applicable, to convert it for use with other gases. The instructions shall deal briefly with the installation regulations (connection, ventilation) in the country where the inset is to be installed.

The instructions shall state the recommended frequency of periodic servicing and draw particular attention to the need for periodic sweeping of the flue of type B_{11BS} insets, according to the regulations in the country where the inset is to be installed.

The instructions shall include:

— the manufacturer's or distributor’s name and address;

— the type name or number (commercial designation);

— the operations of ignition, cleaning and maintenance of the inset;

— a declaration by the manufacturer of area(s) to be considered as a working surface;

— where appropriate, a statement indicating that the gas controls require manual resetting following interruption and subsequent restoration of the electricity supply;

— lighting instructions which state clearly that if any flame supervision device actuating flame is extinguished either intentionally or unintentionally, no attempt shall be made to relight the gas until at least 3 min have elapsed;

— explicit instructions, if applicable, for the correct replacement of artificial solid fuel components or any parts of the fuel bed intended to be removed by the user, and a warning against changing the fuel bed layout or the quantity of material contained therein;

— where appropriate, a statement warning the user not to use the inset if the glass front door or panel has been broken, removed or is open;

— where appropriate, information regarding the safe use of removable handles or of any special tool supplied by the manufacturer;

— a statement that any special removable tool is to be removed after use;

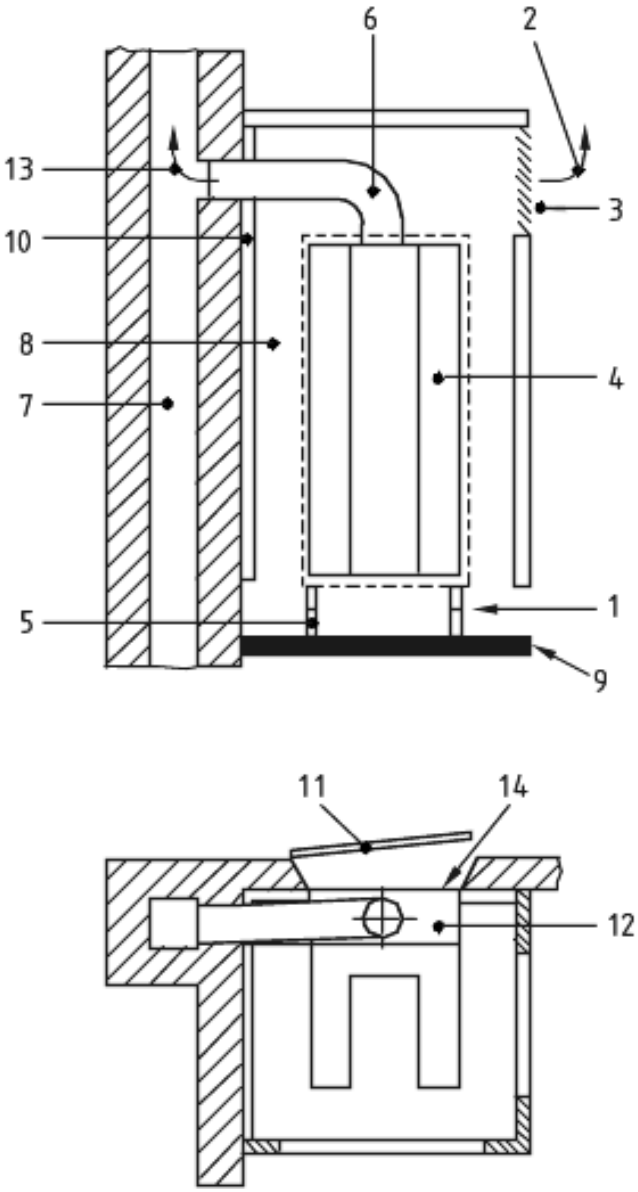
— point out the spillage monitoring system operates if evacuation of the combustion products is interrupted;

— describe the restart procedures;

— point out that, on repeated operation of the spillage monitoring system, a specialist shall be informed.

8.2.4 Additional information

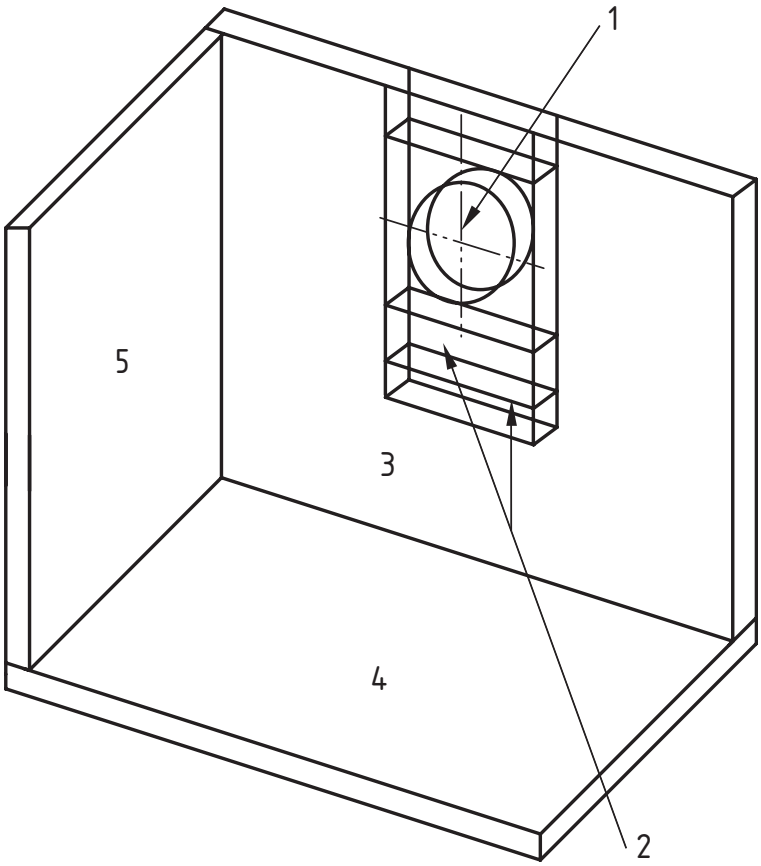
The requirements given in 8.2.4 of EN 613:2000 apply.



Key

1 inset air supply
2 outgoing heated convection air
3 warm air outlet to the room
4 heating inset
5 adjustable support
6 flue pipe
7 chimney
8 warm air chamber
9 floor
10 insulation
11 louvered front door
12 draught diverter
13 combustion gas
14 inset front

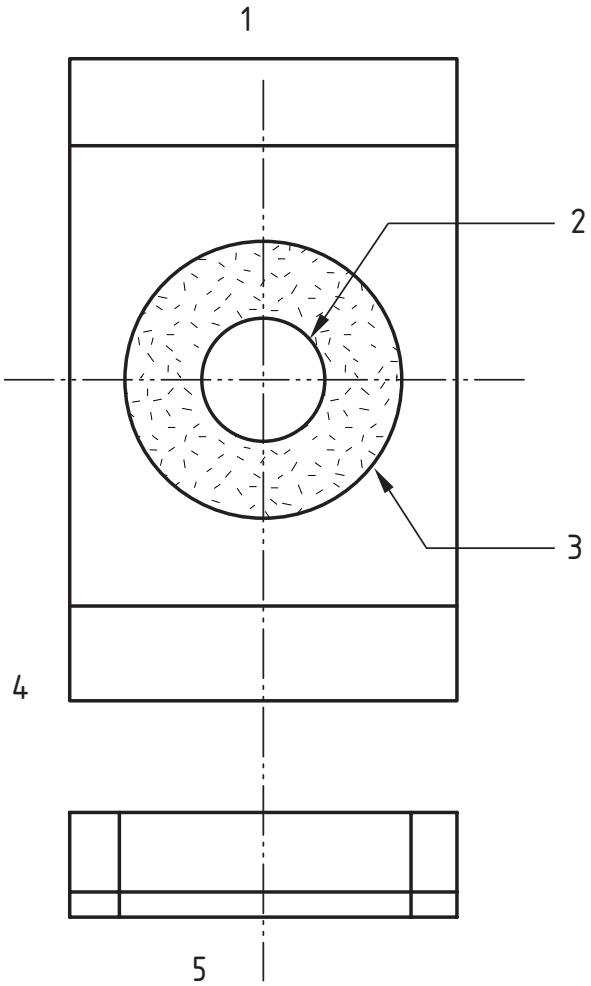
Figure 1 — Installation scheme



Key

1 centre line flue gas connector
2 filler pieces
3 rear wall
4 test hearth
5 side

Figure 2 — View of general arrangement of side walls and test hearth



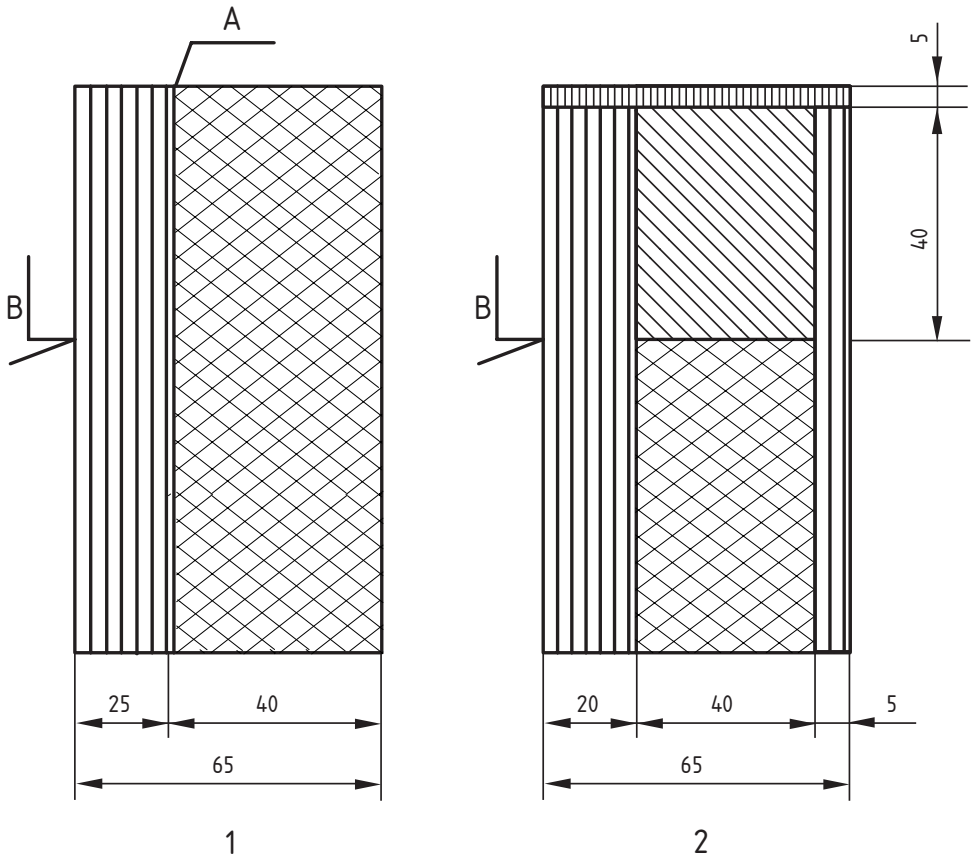
Key

1 elevation
2 flue gas connector
3 clearance of (150 ± 5) mm around flue gas connector filled with insulation
4 same construction as Figure 2
5 plan view

Figure 3 — Details of filler pieces for rear wall

Dimensions in millimetres

Tolerance on dimensions ± 1 mm



Key

	Plywood board – thermal conductivity 0,15 W/m·K	A	Adhesive
	Squared timber	B	Black cover
	Insulation (fibre or plates) thermal conductivity 0,04 W/m·K		
1	Example 1		
2	Example 2		

Figure 4 — Cross-section showing test wall construction

Dimensions in millimetres

Tolerance on dimensions ± 1 mm

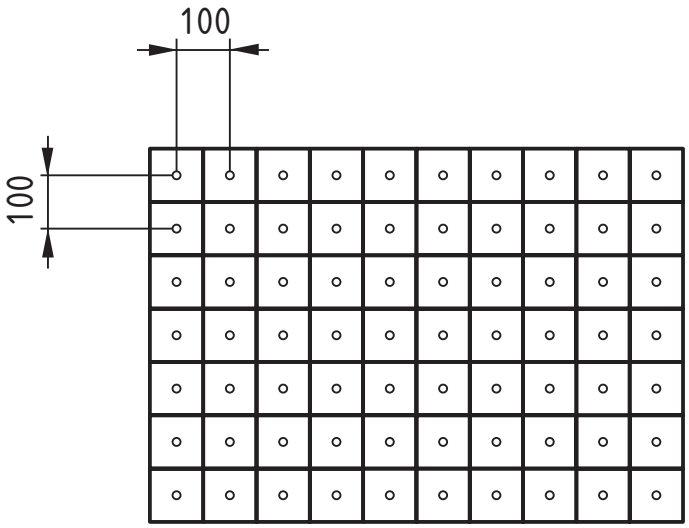
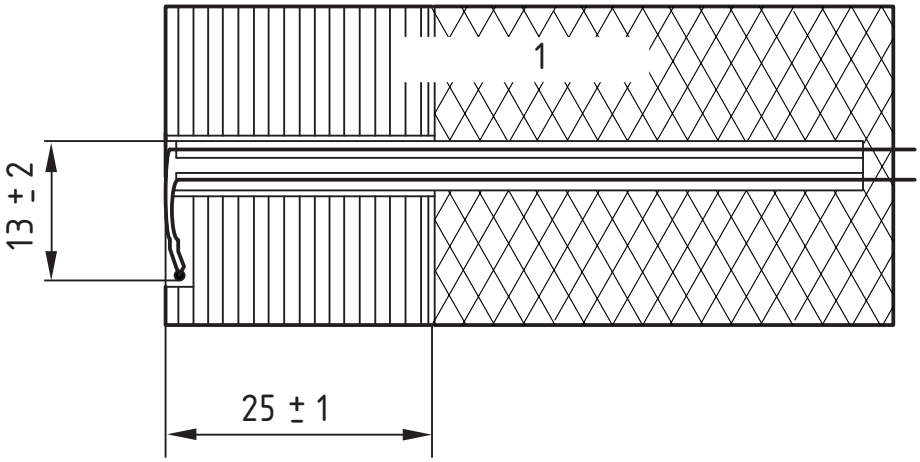


Figure 5 — View of test hearth and walls showing position of measurement points

Dimensions in millimetres



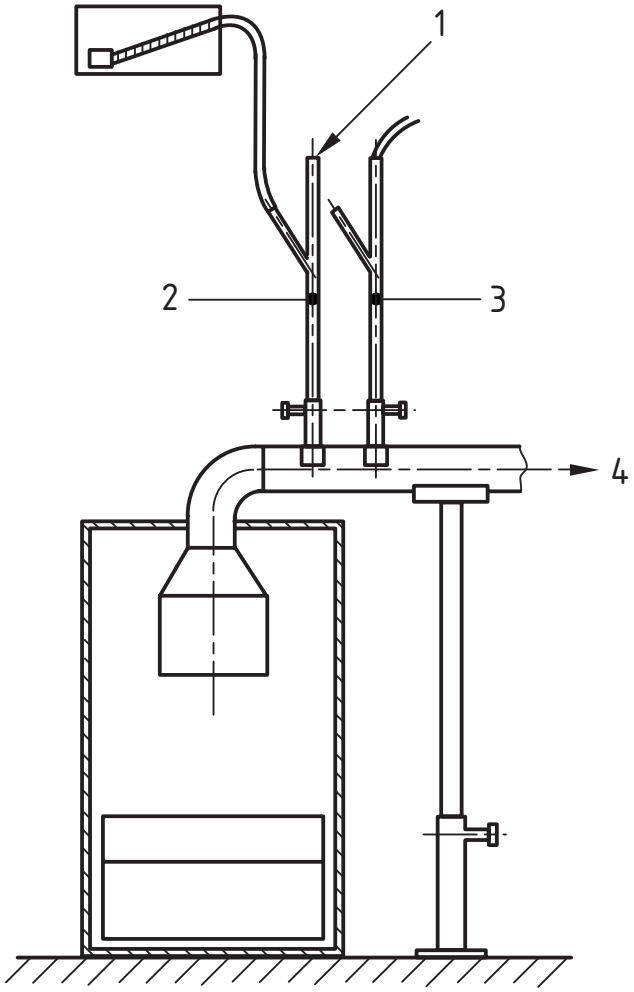
Key

1 test wall

Figure 6 — Details of thermocouples in test wall

Dimensions in millimetres

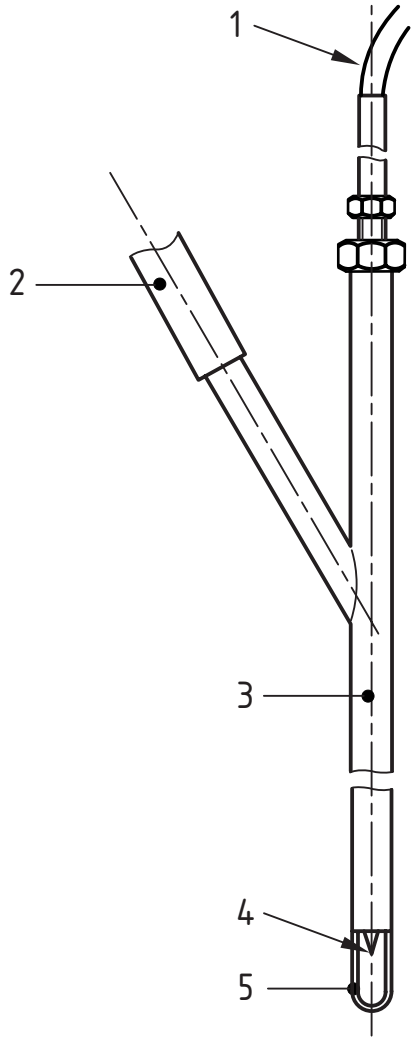
Tolerance on dimensions ± 1 mm



Key

1 closed top
2 probe for measuring suction in Pascal (Pa)
3 probe for measuring CO_2 and temperature of the products of combustion ($2 \times D$)
4 to chimney

Figure 7 — Test probes



Key

1 connection to equipment for measuring CO_2 and temperature
2 connection to pump
3 probe
4 thermocouple
5 protection for thermocouple

Figure 8 — Test probe for measuring CO_2 and temperature of products of combustion

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 90/396/EEC

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 Essential Requirements of the New Approach Directive 90/396/EEC 'The approximation of the laws of Member States concerning gas appliances'.

Once this standard is cited in the Official Journal of the European Communities 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 — Identification form on the compliance of EN 14438 with the essential requirements of EU Directive 90/396 EEC on the approximation of the laws of member states concerning gas

Essential requirement	Subject		Relevant clauses in EN 613:2000 and EN 14438
1.1	Safe design and construction		Whole standard
1.2	Instructions	— installer	8.2.2.1
		— user	8.2.3
	Warning notices	— appliance	8.1.1
		— packaging	8.1.3
	Official language		8
1.2.1	Type of gas used		8.2.2.1
	Gas supply pressure		8.2.2.1
	Fresh air	— for combustion	8.2.2.1
		— products dispersal	8.2.2.1
	Forced draught burners		Not applicable
1.2.2	Instructions for use and servicing		8.2.1 8.2.3
1.2.3	Warning notices on appliance and packaging		8.1.1 8.1.3
1.3	Fittings Instructions		Not applicable
2.1	Appropriate materials		5.1.2 5.1.3
2.2	Properties		1
3.1.1	Durability		5.1.2 5.1.3
3.1.2	Condensation		5.1.2
3.1.3	Explosion risk		5.1.5 5.2
3.1.4	Air/water penetration		Not applicable
3.1.5	Normal fluctuation of auxiliary energy		5.1.8 6.5.3

Table ZA.1 — Identification form on the compliance of EN 14438 with the essential requirements of EU Directive 90/396 EEC on the approximation of the laws of member states concerning gas (*concluded*)

Essential requirement	Subject	Relevant clauses in EN 613:2000 and EN 14438
3.1.6	Abnormal fluctuation of auxiliary energy	5.1.8 6.7.1
3.1.7	Electrical hazards	5.1.8
3.1.8	Deformation	Not applicable
3.1.9	Safety/control device failure — gas circuit — automatic burner control system — flame supervision device — automatic shut off valves — governors — thermostatics	 5.2 5.2.7 5.2.5 5.2.4 5.2.6 5.2.8
3.1.10	Overruling of safety devices	5.2.1
3.1.11	Pre-set adjuster protection	5.2.1 5.2.2
3.1.12	Marking of levers and setting devices	5.2.4.2 to 5.2.4.4
3.2.1	Gas leakage	5.1.5, 6.2.1
3.2.2	Gas release during ignition, re-ignition and extinction	5.4.1, 5.4.2 6.10.2.2 6.10.2.3
3.2.3	Unburned gas accumulation	5.2.4
3.3	Ignition – ignition, re-ignition and cross-lighting	6.5.1
3.4.1	Flame stability Harmful substance	6.5.2 6.7
3.4.2	Combustion products release	6.2.2
3.4.3	Combustion products release	6.9
3.4.4	Flueless domestic appliances	Not applicable
3.5	Rational use of energy	6.11
3.6.1	Floor etc. temperatures	6.4.3
3.6.2	Temperature of knobs/levers	6.4.1, 6.4.2
3.6.3	External parts	6.4.1
3.7	Foodstuffs and water	Not applicable

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

Bibliography

[1] EN 437, *Test gases — Test pressures — Appliance categories*

[2] EN 509, *Decorative fuel-effect gas appliances*

[3] EN 1266, *Independent gas-fired convection heaters incorporating a fan to assist transportation of combustion air and/or flue gases*

[4] EN 13278, *Open fronted gas-fired independent space heaters*

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