



**SLOVENSKI STANDARD**  
**SIST EN 613:2002**  
**01-april-2002**

---

Nezavisni plinski konvekcijski grejalniki

Independent gas-fired convection heaters

Konvektions-Raumheizer für gasförmige Brennstoffe

Appareils de chauffage indépendants à convection utilisant les combustibles gazeux

**iTeh STANDARD PREVIEW**

**Ta slovenski standard je istoveten z: EN 613:2000**  
(standards.iTeh.si)

---

[SIST EN 613:2002](https://standards.iTeh.ai/catalog/standards/sist/46241e6a-acaf-4aae-95b3-48613936fe09/sist-en-613-2002)

<https://standards.iTeh.ai/catalog/standards/sist/46241e6a-acaf-4aae-95b3-48613936fe09/sist-en-613-2002>

**ICS:**

97.100.20

**SIST EN 613:2002**

**en**

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

SIST EN 613:2002

<https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aae-95b3-48613936fe09/sist-en-613-2002>

English version

## Independent gas-fired convection heaters

Appareils de chauffage indépendants à convection utilisant  
les combustibles gazeux

Konvektions-Raumheizer für gasförmige Brennstoffe

This European Standard was approved by CEN on 13 July 2000.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

 **SIST EN 613:2002**

<https://standards.iteh.ai/catalog/standards/sist/46241c6a-acaf-4aac-95b3-48613936fe09/sist-en-613-2002>

EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

<b>Contents</b>	<b>Page</b>
Foreword	4
1 Scope	5
2 Normative references	6
3 Terms and definitions	7
3.1 Independent gas-fired convection heaters	7
3.2 Gases	8
3.3 Appliance construction	10
3.4 Adjusters and controls	13
3.5 Appliance performance	13
3.6 Marking of the appliance and packaging	15
4 Classification of appliances	16
4.1 Classification according to the nature of the gases used (categories)	16
4.2 Classification according to the method of evacuation of the products of combustion	19
5 Constructional requirements	21
5.1 General	21
5.2 Adjusting, control and safety devices	28
5.3 Ignition devices	32
5.4 Flame supervision systems	33
5.5 Burners	34
5.6 Motors and fans	34
5.7 Gas pressure test points	34
6 Operational requirements	34
6.1 General	34
6.2 Soundness of the gas circuit and combustion products circuit, and evacuation of the combustion products	34
6.3 Heat inputs	36
6.4 Temperature of various parts of the appliance	37
6.5 Ignition, cross-lighting and flame stability	38
6.6 Pressure governors	39
6.7 Combustion	39
6.8 Sooting (live fuel effect appliances only)	40
6.9 Spillage monitoring system	41
6.10 Flame supervision device	42
6.11 Efficiency	43
7 Test methods	45
7.1 General	45

7.2 Soundness of the gas circuit and combustion products circuit, and evacuation of the combustion products	54
7.3 Heat inputs	57
7.4 Temperature of various parts of the appliance	60
7.5 Ignition, cross-lighting and flame stability	63
7.6 Pressure governors	67
7.7 Combustion	68
7.8 Sooting (live fuel effect appliances only)	74
7.9 Spillage monitoring system	76
7.10 Flame supervision device	79
7.11 Efficiency	80
8 Marking and instructions	82
8.1 Marking	83
8.2 Instructions	87
Annex A (informative) National situations	103
Annex B (informative) Equivalence rules	115
Annex C (normative) Spillage test methods	118
Annex D (informative) Gas valve arrangements	125
Annex E (informative) Means of identification of the types of gas in force in the various countries	126
Annex F (normative) High voltage ignition circuits	127
Annex G (normative) Apparatus for the determination of the smoke number	130
Annex H (informative) Symbols and abbreviations	132
Annex J (normative) Calculation of conversions of NO <sub>x</sub>	133
Annex K (normative) Special national conditions	134
Annex L (informative) A-deviations	135
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives	136
Bibliography	139

## Foreword

This European Standard 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 replaces HD 1002:1994.

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 2001, and conflicting national standards shall be withdrawn at the latest by June 2001.

This European Standard 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 standard.

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

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

SIST EN 613:2002

<https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aac-95b3-48613936fe09/sist-en-613-2002>

## 1 Scope

This European Standard specifies the requirements and test methods for the construction, safety, marking and rational use of energy of independent gas-fired convection heating appliances, hereafter referred to as appliances.

This standard is applicable to types B<sub>11AS</sub>, B<sub>11BS</sub>, B<sub>11CS</sub> (commonly referred to in this standard as type B<sub>1</sub> appliances) and type C<sub>11</sub> independent convection heating appliances burning gas:

- that incorporate a natural draught burner;
- that are connected directly to an open flue or to a device to evacuate the products of combustion (open-flued appliances, balanced-flued appliances);
- that are wall mounted, free-standing or built-in;
- that have a nominal heat input not exceeding 20 kW (based on the net calorific value).

In addition, this standard is applicable to live fuel effect appliances.

This standard is not applicable to:

- open fronted appliances as specified in prEN 13278;
- decorative fuel effect appliances as specified in EN 509;
- catalytic combustion appliances;
- appliances in which the supply of combustion air and/or evacuation of products of combustion is achieved by mechanical means;
- ducted-air appliances;
- appliances installed by means of a closure plate (see 3.3.3.3).

This standard is only applicable to appliances which are intended to be type tested.

Matters related to quality assurance systems, tests during production and to certificates of conformity of auxiliary devices are not dealt with by this standard.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 88: 1991	Pressure governors for gas appliances for inlet pressure up to 200 mbar
EN 125: 1991	Flame supervision devices for gas-burning appliances - Thermo-electric flame supervision devices
EN 126: 1995	Multifunctional controls for gas burning appliances
EN 161: 1991	Automatic shut-off valves for gas burners and gas appliances
EN 257: 1992	Mechanical thermostats for gas burning appliances
EN 298: 1993	Automatic gas burner control systems for gas burners and gas burning appliances with or without fans
EN 437: 1993	Test gases - Test pressures - Appliance categories
EN 23166: 1993	Codes for the representation of names of countries (ISO 3166: 1993)
EN 60335-1: 1994	Safety of household and similar electrical appliances Part 1: General requirements (IEC 60335-1: 1991, modified)
EN 60529: 1991	Degrees of protection provided by enclosures (IP code) (IEC 60529: 1989)
EN 60730-2-9: 1995	Automatic electrical controls for household and similar use Part 2: Particular requirements for temperature sensing controls (IEC 60730-2-9: 1992, modified)
CR 1404: 1994	Determination of emissions from appliances burning gaseous fuels during type testing
ISO 7-1: 1994	Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation



- ISO 228-1: 1994 Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation
- ISO 274: 1975 Copper tubes of circular section - Dimensions

### 3 Terms and definitions

For the purpose of this standard the following terms and definitions apply:

#### 3.1 Independent gas-fired convection heaters

**3.1.1 convection heater:** An appliance that is designed to heat a room mainly by the emission of air heated by convection. Such an appliance may also contain radiant heating elements provided that it complies with all the requirements of this standard.

**3.1.2 forced convection heater:** A convection appliance that incorporates a fan and thus allows an acceleration of the circulation of the air in contact with the heating body. Such an appliance is designed to discharge air directly into the room in which the appliance is installed and not to be connected to a warm air distribution system.

**3.1.3 live fuel effect convection heater:** A convection appliance which simulates the visual effect of a solid fuel appliance.

**3.1.4 open-fronted appliance:** An appliance which has exposed flames or exposed incandescent areas.

**3.1.5 working surfaces:** Those parts of an appliance, which, due to the nature of the appliance, have temperatures exceeding the limits specified in 6.4.1 excluding parts that are likely to be touched during operations carried out in the normal use of the appliance, for example, the area adjacent to control knobs.

Working surfaces do not include that part of any surface within 25 mm of parts that have to be touched or removed during normal operation of the appliance.

**3.1.6 convection fan:** A device to assist in the distribution of heated air.

## 3.2 Gases

### 3.2.1 reference conditions:

- for calorific values, temperature: 15 °C;
- for gas and air volumes dry, brought to 15 °C and an absolute pressure of 1 013,25 mbar.

**3.2.2 calorific value:** The quantity of heat produced by the combustion, at a constant pressure of 1 013,25 mbar, of unit volume or mass of gas, the constituents of the combustible mixture being taken at reference conditions and the products of combustion being brought back to the same conditions.

A distinction is made between:

- the gross calorific value in which the water produced by combustion is assumed to be condensed.

Symbol:  $H_s$

- the net calorific value in which the water produced by combustion is assumed to be in the vapour state.

Symbol  $H_i$

Units: either:

- megajoules per cubic metre ( $\text{MJ/m}^3$ ) of dry gas at the reference conditions; or
- megajoules per kilogram ( $\text{MJ/kg}$ ) of dry gas.

ITeH STANDARD PREVIEW  
(standards.iteh.ai) [EN 437: 1993]

**3.2.3 relative density:** The ratio of the masses of equal volumes of dry gas and dry air at the same conditions of temperature and pressure.

Symbol:  $d$

<https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aac-95b3-48613936fe09/sist-en-613-2002>

**3.2.4 Wobbe index:** The ratio of the calorific value of a gas per unit volume and the square root of its relative density under the same reference conditions. The Wobbe index is said to be gross or net according to whether the calorific value used is the gross or net calorific value.

Symbol: gross Wobbe index:  $W_s$

net Wobbe index:  $W_i$

Units: either:

- megajoules per cubic metre ( $\text{MJ/m}^3$ ) of dry gas at the reference conditions, or
- megajoules per kilogram ( $\text{MJ/kg}$ ) of dry gas.

[EN 437: 1993]

**3.2.5 test pressures:** Gas pressures used to verify the operational characteristics of appliances using combustible gases. They consist of normal and limit pressures.

They are expressed in millibar (mbar).

NOTE 1 mbar = 100 Pa

**3.2.6 normal pressure:** The pressure under which appliances operate in nominal conditions, when they are supplied with the corresponding reference gas.

Symbol:  $p_n$

**3.2.7 limit pressures:** Pressures representative of the extreme variations in the appliance supply condition.

Symbols: maximum pressure:  $p_{\max}$

minimum pressure:  $p_{\min}$

**3.2.8 pressure couple:** Combination of two distinct gas distribution pressures applied by reason of the significant difference existing between the Wobbe indices within a single family or group in which:

- the higher pressure corresponds only to gases of low Wobbe index;

and

- the lower pressure corresponds to gases of high Wobbe index.

[EN 437: 1993]

### 3.3 Appliance construction

#### 3.3.1 The gas circuit

**3.3.1.1 inlet connection:** The part of the appliance intended to be connected to the gas supply.

**3.3.1.2 mechanical joint:** A connection device assuring soundness in an assembly of several parts, generally of metal.

NOTE for example the following:

- cone seated joints;
- torroidal sealing rings ('O' rings);
- flat joints;
- metal to metal joints;

**3.3.1.3 gas circuit:** The part of an appliance that conveys or contains the gas between the appliance gas inlet connection and the burner(s).

**3.3.1.4 gas restrictor:** A non-adjustable device which is placed in the gas circuit so as to create a pressure drop and thus reduce the gas pressure at the burner to a predetermined value for a given supply pressure and rate.

**3.3.1.5 gas rate adjuster:** A component intended for the manufacturer or installer to set the gas rate to each burner at a predetermined value according to the supply conditions.

The adjustment may be progressive (screw adjuster) or discontinuous (changing restrictors).

The adjuster of an adjustable governor is regarded as a gas rate adjuster.

The action of setting this device is called 'setting the gas rate'.

**3.3.1.6 gas rate control:** A component allowing the user to open or close the gas supply to one or more burners. It may also be used to adjust the gas rate of certain burners to a predetermined value, called the 'reduced rate'. This device may be a 'tap'.

**3.3.1.7 injector:** A component that admits the gas into a burner.

**3.3.1.8 start gas:** The initial quantity of gas ignited to give a flame which is used to ignite the main burner. It may be discharged through a separate ignition burner or part of the main burner.

### 3.3.2 Burner

**3.3.2.1 main burner:** A burner that assures the thermal function of an appliance. It is usually called simply 'burner'.

**3.3.2.2 ignition burner:** A separate burner intended to light the main burner.

**3.3.2.2.1 permanent ignition burner:** An ignition burner that operates continuously throughout the whole period that the appliance is in use.

**3.3.2.2.2 intermittent ignition burner:** An ignition burner that is ignited before and extinguished at the same time as the main burner.

**3.3.2.3 fixed primary aeration restrictor:** A non-adjustable device which limits the supply of primary air to a burner.

### 3.3.3 Combustion products circuit

**3.3.3.1 flue outlet:** The part of a type B appliance (see 4.2) that connects with a flue to evacuate the products of combustion.

**3.3.3.2 draught diverter:** A device placed in the combustion products circuit to reduce the influence of flue-pull and to minimize the effect of down-draught on the burner flame stability and combustion.

**3.3.3.3 closure plate:** A non-combustible plate used to cover and seal the front plane of a builder's opening, or fireplace opening, such that when the appliance is installed, any air flowing from the room into the flue does so in accordance with the design requirements of the appliance.

This plate contains an aperture through which the flue outlet spigot of the appliance projects into the cavity of the builder's opening or fireplace recess, but is not connected to the flue.

The plate may be a separate component, or an integral part of the appliance, e.g. the back panel, but in either case it is to be considered as part of the appliance.

**3.3.3.4 builder's opening:** The enclosure constructed by the builder to accommodate fireplace components.

**3.3.3.5 fireplace opening:** The aperture formed in the face of the builder's opening, the fireplace recess or fire surround if fitted.

**3.3.3.6 fireplace recess:** The recess formed by the inclusion of fireplace components in the builder's opening.

### 3.3.4 Auxiliary equipment

**3.3.4.1 pressure governor:** A device that maintains, within a fixed range, a constant downstream pressure, independent of the upstream pressure and/or the gas rate.

**3.3.4.2 ignition device:** A device that ignites one or more burners.

**3.3.4.3 flame supervision device:** A device, including a sensing element, that causes the gas supply to a burner to be opened or closed according to the presence or absence of the flame that activates the sensing element.

**3.3.4.4 combustion products discharge safety device:** A device that automatically shuts off the gas supply to the main burner, and perhaps to the ignition burner, when there is unacceptably high spillage of combustion products from the draught diverter.

**3.3.4.5 atmosphere sensing device:** A device designed to shut off the gas supply before the combustion products of the surrounding atmosphere reaches a set value.

**3.3.4.6 control knob:** A component designed to be moved by hand in order to operate an appliance control (tap, thermostat, etc.).

**3.3.4.7 programming unit:** A unit which reacts to signals from control and safety devices, gives control commands, controls the start up sequence, supervises the burner operation and causes controlled shut-down, and if necessary safety shut-down and lock-out. The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector device.

[SIST EN 613:2002](https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aac-95b3-86c3936600/sist-en-613-2000)

[https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aac-95b3-](https://standards.iteh.ai/catalog/standards/sist/46241e6a-acaf-4aac-95b3-86c3936600/sist-en-613-2000)

**3.3.4.8 flame detector device:** A device by which the presence of a flame is detected and signalled.

It can consist of a flame sensor, an amplifier and a relay for signal transmission. These parts, with the possible exception of the actual flame sensor, may be assembled in a single housing for use in conjunction with a programming unit.

**3.3.4.9 automatic burner system:** A burner system in which, when starting from the completely shut-down condition, the gas is ignited and the flame is detected and proved and the main gas valve(s) is actuated without manual intervention.

**3.3.4.10 restart interlock (manual):** A device which prevents the restoration of the gas supply to the main burner, or to the main burner and ignition burner, until the end of the extinction delay time.

### 3.4 Adjusters and controls

**3.4.1 setting an adjuster:** The action of immobilizing an adjuster in position by some means such as a screw, etc. It is said that the adjuster is "set" in this position.

**3.4.2 sealing an adjuster:** The procedure by which after setting an adjuster, material is added such that any attempt to alter the adjustment setting is apparent.

A factory sealed pre-set adjuster is considered to be non-existent.

A pressure governor is considered to be non-existent if it has been factory sealed in the fully opened position.

**3.4.3 putting a control out of service:** The procedure by which a control (of temperature, pressure, etc.) is put out of action and sealed in this position. The appliance then functions as if this device had been removed.

### 3.5 Appliance performance

#### 3.5.1 Gas rates

**3.5.1.1 volumetric flow rate:** The volume of gas consumed by the appliance in unit time during continuous operation.

Symbol:  $V$

Units: cubic metres per hour ( $\text{m}^3/\text{h}$ ), litres per minute ( $\text{l}/\text{min}$ ), cubic decimetres per hour ( $\text{dm}^3/\text{h}$ ), or cubic decimetres per second ( $\text{dm}^3/\text{s}$ ).

[EN 437: 1993]

**3.5.1.2 mass flow rate:** The mass of gas consumed by the appliance in unit time during continuous operation.

Symbol:  $M$

Units: kilograms per hour ( $\text{kg}/\text{h}$ ), or grams per hour ( $\text{g}/\text{h}$ )

[EN 437: 1993]