SLOVENSKI STANDARD
oSIST prEN 613:2018

01-julij-2018

[Not translated]

Independent closed-fronted gas-fired type B11, type C11, type C31 and type C91 heaters

Konvektions-Raumheizer für gasförmige Brennstoffe

Appareils de chauffage indépendants à foyer fermé utilisant les combustibles gazeux de types B11, C11, C31 et C91

Ta slovenski standard je istoveten z: prEN 613

ICS:

97.100.20 Plinski grelniki Gas heaters

oSIST prEN 613:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 613

May 2018

ICS 97.100.20

Will supersede EN 613:2000

English Version

Independent closed-fronted gas-fired type B11, type C11, type C31 and type C91 heaters

Appareils de chauffage indépendants à foyer fermé utilisant les combustibles gazeux de types B11, C11, C31 et C91

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 62.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. prEN 613:2018 E

Contents

Page

European foreword ... 6
1 Scope ... 7
2 Normative references ... 7
3 Terms and definitions ... 8
3.1 Independent gas-fired heaters ... 8
3.2 Gases ... 9
3.3 Appliance construction ... 9
3.3.1 The gas circuit ... 9
3.3.2 Burner ... 10
3.3.3 Combustion products circuit ... 11
3.3.4 Auxiliary equipment ... 11
3.4 Appliance performance ... 12
3.4.1 Gas rates ... 12
3.4.2 Gas combustion ... 13
3.5 Marking of the appliance and packaging ... 14
4 Classification of appliances ... 14
4.1 Classification according to the nature of the gases used (categories) ... 14
4.1.1 Classification of gases ... 14
4.1.2 Appliance categories ... 14
4.2 Classification according to the method of evacuation of the products of combustion ... 15
5 Constructional requirements ... 16
5.1 General ... 16
5.1.1 Conversion to different gases ... 16
5.1.2 Materials and method of construction ... 17
5.1.3 Accessibility for use and maintenance ... 17
5.1.4 Connections ... 18
5.1.5 Soundness of the gas circuit ... 18
5.1.6 Soundness of the combustion circuit ... 19
5.1.7 Supply of combustion air and evacuation of combustion products ... 19
5.1.8 Electrical equipment ... 20
5.1.9 Safety in the event of fluctuation, interruption and restoration of the auxiliary energy ... 20
5.2 Adjusting, control and safety devices ... 21
5.2.1 General ... 21
5.2.2 Gas rate adjusters ... 21
5.2.3 Aeration adjuster ... 21
5.2.4 Shut-off valves ... 22
5.2.5 Flame supervision devices ... 22
5.2.6 Pressure regulators ... 23
5.2.7 Automatic burner control system ... 23
5.2.8 Thermostats ... 23
5.2.9 Spillage monitoring system ... 23
5.2.10 Manually operated devices ... 23
5.3 Ignition devices ... 24
5.3.1 Direct ignition of the main burner ... 24

5.3.2 Ignition burner 24
5.4 Flame supervision systems 24
5.4.1 General 24
5.4.2 Appliances with automatic burner systems 24
5.5 Burners 25
5.6 Gas pressure test points 25

6 Operational requirements 25
6.1 General 25
6.2 Soundness of the gas circuit and combustion products circuit, and evacuation of the combustion products 25
6.2.1 Soundness of the gas circuit 25
6.2.2 Soundness of the combustion products circuit and evacuation of the combustion products 25
6.2.3 Escape of unburnt gas (type B_1 appliances only) 26
6.3 Heat inputs 26
6.3.1 Nominal heat input 26
6.3.2 Start gas heat input 26
6.3.3 Reduces rate 26
6.4 Temperature of various parts of the appliance 27
6.4.1 Temperature of external parts of the appliance 27
6.4.2 Temperature of components 27
6.4.3 Temperature of floor, shelf and walls 27
6.5 Ignition, cross-lighting and flame stability 27
6.5.1 Ignition and cross-lighting 27
6.5.2 Flame stability (all appliances) 28
6.5.3 Fluctuation of the auxiliary energy 28
6.6 Pressure regulators 28
6.7 Combustion 28
6.7.1 CO concentration for all appliances 28
6.7.2 Measurement of oxides of nitrogen, NO_x, (all appliances) 29
6.8 Sooting (live fuel effect gas-fired heaters only) 29
6.8.1 Cold condition 29
6.8.2 Hot condition 29
6.8.3 Long cycle condition 29
6.9 Spillage monitoring system 29
6.9.1 Atmosphere sensing device (type B_{11AS} appliances only) 29
6.9.2 Combustion products discharge safety device (type B_{11BS} appliances only) 29
6.9.3 Type B_{11CS} appliances 30
6.10 Flame supervision device 30
6.10.1 Thermoelectric device 30
6.10.2 Automatic burner control system 30
6.11 Efficiency 31

7 Test methods 31
7.1 General 31
7.1.1 Characteristics of test gases: reference and limit gases 31
7.1.2 Conditions for preparation of the test gases 31
7.1.3 Practical application of test gases 31
7.1.4 Test pressures 32
7.1.5 General test conditions 33
7.2 Soundness of the gas circuit and combustion products circuit and evacuation of the combustion products 34

7.2.1 Soundness of the gas circuit 34
7.2.2 Soundness of the combustion products circuit and evacuation of the combustion products 35
7.2.3 Escape of unburnt gas (type B_1 appliances only) 36
7.3 Heat inputs 36
7.3.1 Nominal heat input 36
7.3.2 Calibrated injector rate of appliance without gas rate adjusters or where these adjusters are put out of action 37
7.3.3 Performance of gas rate adjusters for ungoverned appliances 38
7.3.4 Start gas heat input 38
7.3.5 Reduced rate 38
7.4 Temperature of various parts of the appliance 38
7.4.1 General 38
7.4.2 Temperature of external parts of the appliance 38
7.4.3 Temperature of components 38
7.4.4 Temperature of floor, shelf and walls 39
7.5 Ignition, cross-lighting and flame stability 40
7.5.1 Ignition and cross-lighting 40
7.5.2 Flame stability 41
7.5.3 Effects of room draughts (for type B_1 appliances) 42
7.5.4 Wind tests for type C_{11}, C_{31} and C_{91} appliances 42
7.6 Pressure regulators 44
7.6.1 Operational pressure regulator 44
7.6.2 Pressure regulator out of service 44
7.7 Combustion 45
7.7.1 General 45
7.7.2 Tests under limit conditions 46
7.7.3 Supplementary tests under special conditions 47
7.7.4 Measurement of oxides of nitrogen (all appliances) 47
7.8 Sooting (live fuel effect gas-fired heaters only) 49
7.8.1 General 49
7.8.2 Determination of the smoke number 49
7.8.3 Test conditions 49
7.9 Spillage monitoring system 50
7.9.1 General 50
7.9.2 Atmosphere sensing device (type B_{11AS} appliances) 50
7.9.3 Combustion products discharge safety device (type B_{11BS} appliances) 51
7.10 Flame supervision device 52
7.10.1 Thermoelectric device 52
7.10.2 Automatic burner control systems 52
7.11 Efficiency 53
7.11.1 Installation and gas supply 53
7.11.2 Determination of efficiency 53
8 Marking and instructions 54
8.1 General 54
8.2 Marking 54
8.2.1 Marking of the appliance 54
8.2.2 Other marking 55
8.2.3 Marking of the packaging 55
8.2.4 Utilization of symbols on the appliance and packaging 56
8.3 Instructions 58

8.3.1 General 58
8.3.2 Instructions for installation, use and servicing and adjustment 58
8.3.3 Instructions for use and servicing 60
8.3.4 NOx requirements 61
9 Risk Assessment 61
Annex A (normative) Spillage test methods 76
A.1 Spillage plate test method 76
A.1.1 Apparatus 76
A.1.2 Method 76
A.2 Hood test method 78
A.2.1 Installation 78
A.2.2 Preliminary adjustment 78
Annex B (informative) Gas valve arrangements 82
Annex C (informative) Gas designations in force in the various EU countries 83
Annex D (normative) Apparatus for the determination of the smoke number 85
D.1 Pump 85
D.2 Sampling tube 85
D.3 Filter paper 85
D.4 Grey scale 85
Annex E (informative) Symbols and abbreviations 86
Annex F (normative) Calculation of conversions of NOx 87
Annex G (normative) Arrangement for measuring the leakage rate 88
Annex H (normative) Special national conditions 89
H.1 General 89
H.2 Belgium 89
Annex ZA (informative) Clauses of this European Standard addressing essential requirements or other provisions of EU Directives 90
Bibliography 93

European foreword

This document (prEN 613:2018) has been prepared by Technical Committee CEN/TC 62 “Independent gas-fired space heaters”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 613:2000.

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.

1 Scope

This document specifies the requirements and test methods for the construction, safety, marking and rational use of energy.

This standard is applicable to types B_{11}, type C_{11}, type C_{31} and type C_{91} appliances that burn gas and:

— are closed-fronted;

— incorporate a natural draught burner;

— are connected directly to an open flue or to a device to evacuate the products of combustion (open-flued appliances, balanced-flued appliances);

— are wall mounted, free-standing or built-in;

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

This document is not applicable to:

— open fronted appliances as specified in EN 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 as specified in EN 1266;

— ducted-air appliances;

— appliances installed by means of a closure plate (see 3.3.3.3).

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

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 88 (all parts), *Pressure governors for gas appliances for inlet pressure up to 200 mbar*

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

EN 126, *Multifunctional controls for gas burning appliances*

EN 161, *Automatic shut-off valves for gas burners and gas appliances*

EN 257, *Mechanical thermostats for gas-burning appliances*

EN 298, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 437:2003+A1:2009, *Test gases — Test pressures — Appliance categories*

CR 1404, *Determination of emissions from appliances burning gaseous fuels during type-testing*

EN 10305-1, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 60335-1:1994, *Safety of household and similar electrical appliances — Part 1: General requirements (IEC 60335-1:1991, modified)*

EN 60335-2-102, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102)*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 60730-2-9, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9)*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1)*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 437 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1 Independent gas-fired heaters

3.1.1
closed-fronted appliance
appliance which does not have exposed flames or exposed incandescent areas

Note 1 to entry: Access to the flame is prevented by a panel made of glass, metal or a suitable material.

Note 2 to entry: Type C1 and type C3 appliances are room-sealed appliances.

3.1.2
forced gas-fired heater
appliance that incorporates a fan and thus allows an acceleration of the circulation of the air in contact with the heating body

Note 1 to entry: Such an appliance is designed to discharge heated air directly into the room in which the appliance is installed.

3.1.3
live fuel effect gas-firedheater
appliance which has a visual flame effect

3.1.4
open-fronted appliance
appliance which has exposed flames or exposed incandescent areas

3.1.5
working surfaces
area of the appliance that generates and emits heat

Note 1 to entry: Examples of working surfaces include fire bricks, refractories, imitation fuel, fire fronts, fire baskets, burners, burner trays and bracketry.

[SOURCE: EN 509:1999, 3.1.2]

3.1.6
convection fan
device to assist in the distribution of heated air

3.2 Gases

All terms and definitions relating to gases are specified in EN 437.

3.3 Appliance construction

3.3.1 The gas circuit

3.3.1.1
inlet connection
part of the appliance intended to be connected to the gas supply

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

Note 1 to entry: For example the following:

— cone seat joints;

— torroidal sealing rings ('O' rings);

— flat joints;

— metal to metal joints.

3.3.1.3
gas circuit
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
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
component intended for the manufacturer or installer to set the gas rate to each burner at a predetermined value according to the supply conditions

Note 1 to entry: The adjustment can be progressive (screw adjuster) or discontinuous (changing restrictors).

Note 2 to entry: The adjuster of an adjustable governor is regarded as a gas rate adjuster.

Note 3 to entry: The action of setting this device is called 'setting the gas rate'.

3.3.1.6
gas rate control
component allowing the user to open or close the gas supply to one or more burners.

Note 1 to entry: It may also be used to adjust the gas rate of certain burners to a predetermined value, called the 'reduced rate'. This device can be a 'tap'.

3.3.1.7
injector
component that admits the gas into a burner, where the section of the outlet orifice is fixed

3.3.1.8
start gas
initial quantity of gas ignited to give a flame which is used to ignite the main burner

Note 1 to entry: It can be discharged through a separate ignition burner or part of the main burner.

3.3.2 Burner

3.3.2.1
main burner
burner that provides the primary thermal function of the appliance

3.3.2.2
pilot burner
burner intended to light the main burner and that supplements the main burner in providing a thermal function of the appliance

3.3.2.2.1
permanent pilot
pilot burner that operates continuously throughout the whole period that the appliance is in use, independent of the main burner, and has to be extinguished by manual intervention

3.3.2.2.2
non-permanent pilot
pilot burner that is extinguished automatically when there is no heat demand

3.3.2.3
fixed primary aeration restrictor
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
part of a type B appliance that connects with a flue to evacuate the products of combustion

3.3.3.2
draught diverter
device placed in the combustion product's 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
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

Note 1 to entry: 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.

Note 2 to entry: The plate can 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
enclosure constructed to accommodate fireplace components

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

3.3.3.6
fireplace recess
recess formed by the inclusion of fireplace components in the builder's opening

3.3.4 Auxiliary equipment

3.3.4.1
pressure governor
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
device that ignites one or more burners

3.3.4.3
flame supervision device
device that senses the absence or presence of a flame

3.3.4.4
combustion products discharge safety device
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
device that reacts to the lack of oxygen in the surrounding atmosphere

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

3.3.4.7
programming unit
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

Note 1 to entry: The programming unit follows a predetermined sequence of actions and always operates in conjunction with a flame detector device.

3.3.4.8
flame detector device
device by which the presence of a flame is detected and signalled

Note 1 to entry: 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
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
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 Appliance performance

3.4.1 Gas rates

3.4.1.1
nominal heat input
Q_n
value of the heat input declared by the manufacturer.

Note 1 to entry: Unit: kilowatt (kW).

3.4.2 Gas combustion

3.4.2.1
flame stability
state of the flames resting in a stable manner on the burner ports or the flame contact area provided by the design with no flame lift or light-back

3.4.2.2
flame lift
phenomenon characterized by the total or partial lifting of the base of the flame from the burner port or the flame contact area provided by the design

3.4.2.3
light-back
phenomenon characterized by the entry of a flame into the body of a burner

3.4.2.4
light-back at the injector
phenomenon characterized by ignition of the gas at the injector, either as a result of the flame entering the burner or by the propagation of a flame around the outside of the burner

3.4.2.5
sooting
phenomenon characterized by deposits of soot on the surfaces of parts of the appliance in contact with the products of combustion or with the flame, or as particulate matter in the combustion products

3.4.2.6
yellow tipping
phenomenon characterized by the appearance of yellow colouring at the top of the blue cone of an aerated flame

3.4.3
safety time
interval between the ignition burner gas valve, the start gas valve or main gas valve, as applicable, being energized and the ignition burner gas valve, start gas valve or main gas valve, as applicable, being de-energized if the flame detector signals the absence of a flame

3.4.4
extinction delay time
time that elapses between the disappearance of the flame and the interruption of the gas supply

3.4.5
ignition delay time
time that elapses between ignition of the supervised flame and the moment when the closure element is held open by the flame signal

Note 1 to entry: This applies to a thermoelectric flame supervision device.

3.4.6
thermal equilibrium
operating state of the appliance, corresponding to a particular setting of the input, in which the flue gas temperature does not change by more than ± 2 K over a period of 10 min