SLOVENSKI STANDARD
SIST EN 297:1997/A4:2005

01-april-2005

Plinski kotli za centralno ogrevanje - Tipa B11 in B11BS z atmosferskimi gorilniki z imensko močjo do vključno 70 kW - Dopolnilo A4

Gas-fired central heating boilers - Type B11 and B11BS boilers, fitted with atmospheric burners of nominal heat input not exceeding 70 kW

Heizkessel für gasförmige Brennstoffe - Heizkessel der Typen B11 und B11BS mit atmosphärischen Brennern, mit einer Nennwärmeleistung kleiner als oder gleich 70 kW

Chaudieres de chauffage central utilisant les combustibles gazeux - Chaudieres de types B11 et B11BS équipées de bruleurs atmosphériques dont le débit calorifique nominal est inférieur ou égal a 70 kW

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This amendment A4 modifies the European Standard EN 297:1994; it was approved by CEN on 14 November 2003.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 297:1994/A4:2004) has been prepared by Technical Committee CEN /TC 109 "Central heating boilers using gaseous fuels", the secretariat of which is held by NEN.

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of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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).

With this amendment, the requirements and test methods for type B boilers with fan-assisted combustion are introduced in EN 297. In addition requirements and test procedures for non-fanned appliances are modified.

Title of the document

Change in the title of the document

“ Type B_{11} and B_{11BS} boilers"

to

“ Type B boilers"

1.1 Field of application

Replace the existing text by:

“ This document specifies the requirements and test methods for the construction, safety, fitness for purpose, rational use of energy, classification and marking of gas-fired central heating boilers, hereafter referred to as ‘boilers’.

This document applies to type B_{11}, B_{11BS}, B_{12}, B_{12BS}, B_{13}, B_{13BS}, B_{14}, B_{22}, B_{23}, B_{32}, B_{33}, B_{44}, B_{52} and B_{53} boilers as listed in 1.4.2.2:

- that use gases corresponding to the three gas families and to the pressures stated in 4.1.4;
- that have a nominal heat input not exceeding 70 kW (on net calorific value);
- where the temperature of the water does not exceed 95 °C during normal operation;
- where the maximum water-side operating pressure does not exceed 6 bar;
- fitted with atmospheric burners, atmospheric burners assisted by a fan for the supply of combustion air or the evacuation of combustion products or premixed burners;
- and that may be fitted with electrically operated mechanical flue dampers that are positioned downstream of the heat exchanger and tested as an integral part of the boiler.

This document does not contain all the necessary requirements for boilers:

- intended to be installed in the open;
- having multiple heating units with a single draught-diverter;
- of the condensing type;
- intended to be connected to a common flue having mechanical extraction;
- fitted with manual means of adjusting the air supply and/or adjusting the evacuation of the combustion products;
- of the combination type (central heating and domestic hot water production);
- without a draught-diverter and not incorporating a fan;
- specifically of the types B_{21}, B_{31}, B_{41}, B_{42}, B_{43} and B_{51};

nor for appliances:

- combining the functions of an independent space heater and a hot water generator for central heating.

This document only covers appliances where the fan, if any, is an integral part of the appliance.

This document only covers appliances where the flue damper, if any, is an integral part of the appliance.

This document only covers type testing.”

Add after "… as listed in 1.4.2.2:" at the end of the second sentence of the new clause 1.1 a footnote as follows:

“ National installation regulations may limit the modes of installation permitted in the territory of a CEN member state.”

1.2 Normative references

Add:

”EN 1443, *Chimneys — General requirements.*

EN 1856-1, *Chimneys — Requirements for metal chimneys — Part 1: System chimney products.*

prEN 1856-2, *Chimneys — Performance requirements for metal chimneys — Part 2: Metal liners and connecting flue pipes products.*

EN 1859, *Chimneys — Metal chimneys — Test methods.*

EN 12067-1, *Gas/air ratio controls for gas burners and gas burning appliances — Part 1: Pneumatic types.*

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

Delete:

“ EN 60335-1, *Safety of household and similar electrical appliances - Part 1:General requirements*”

1.3 Definitions

Renumber clause 1.3.4.14 “living space dedicated boiler” as 1.3.5.

Add a new subclause, as follows:

“ 1.3.3.1.10.4
premixed burner

burner in which the gas and a quantity of air at least equal to that theoretically necessary for complete combustion are mixed before the flame ports”

1.3.3.2.3
draught diverter

Add a note to the existing text:

“ NOTE For type B14 and B44 boilers the device may only be suitable to compensate for the pressure variations within the flue system.”

Add new subclauses, as follows:

“ 1.3.3.2.5
protected combustion chamber

combustion chamber which is constructed such that an ignition in the combustion chamber does not ignite an air/gas mixture outside the combustion chamber

1.3.3.2.6
combustion circuit

circuit including the air supply circuit, if any, the combustion chamber, the heat exchanger, the combustion products evacuation duct, if any, and either the connection to the flue or to the terminal, if any

1.3.3.2.7
air supply circuit

means for transporting combustion air to the burner

1.3.3.2.8
combustion products evacuation duct

means for transporting combustion products to the flue or to the terminal

1.3.3.2.9
damper

device placed in the air inlet or the flue outlet to control the volume flow

1.3.3.2.10
total passage

cross-sectional area of the air inlet or the flue way that would be available to the combustion air or the flue gases if the closure member of the damper was removed

1.3.3.2.11
terminal

device fitted to the outside of the building, which is connected to the combustion products evacuation ducts of a type B_4 or B_5 boiler

1.3.3.2.12
terminal guard

device that protects the terminal from mechanical damage from outside influences"

1.3.3.3.19
automatic valve[1)]

*In the footnote, replace "*A, B, C and D*" to "*A, B, C, D and J*":*

1.3.4.6
ignition rate

Replace the existing text by:

" average heat input during the ignition safety time.

Symbol Q_{IGN}

Unit: kilowatt (kW)."

Add three new subclauses, as follows:

" 1.3.4.14
purge

mechanical introduction of air into the combustion products circuit in order to displace any gas/air mixture or combustion product which could remain there. A distinction is made between:

- pre-purge: the purge that takes place between the start command and the ignition device being energised;
- post-purge: the purge that is carried out after burner shutdown"

" 1.3.4.15
air proving device

device intended to cause safety shutdown in the event of abnormal conditions of air supply or of combustion products evacuation"

" 1.3.4.16
gas/air ratio control

device that automatically adapts the combustion air rate to the gas rate or vice versa"

1.4.2.2 Classification according to the method of evacuation of the products of combustion (types)

Add at the end of this heading a new footnote as follows:

“ The classification used in this document is based upon the classification of CR 1749, "European scheme for the classification of gas appliances according to the method of evacuation of the products of combustion (types)".”

Replace the existing text of 1.4.2.2 by:

“ **1.4.2.2.1 General**

A Type B boiler is a boiler intended to be connected to a flue evacuating the combustion products to the outside of the room where the boiler is installed. The combustion air is drawn directly from the room.

Type B boilers are classified into several types according to the mode of evacuation of the combustion products.

The types are defined by two subscripts:

- The first subscript number is based upon the possible installation of the boiler with respect to the mode of air supply and evacuation of the combustion products (see 1.4.2.2.2).
- The second subscript number is based upon the presence and position of an integral fan in the boiler (see 1.4.2.2.3).

Type B boilers with a combustion products discharge safety device as defined in 1.3.3.2.4, are designated with an extra subscript “BS”.

A type B boiler intended to operate with a pressurised flue duct is identified by an extra subscript “P”. This subscript “P” is only used when installation in accordance with the boiler manufacturer’s instructions on a flue specified by the boiler manufacturer results in the flue operating at a positive pressure[4].”

1.4.2.2.2 Boiler types

1.4.2.2.2.1 Type B_1

A type B boiler incorporating a draught diverter.

1.4.2.2.2.2 Type B_2

A type B boiler without a draught diverter.

1.4.2.2.2.3 Type B_3

A type B boiler without a draught diverter, which is designed for connection to a common duct system. This common duct system consists of a single natural draught flue. All pressurised parts of the appliance containing products of combustion are completely enclosed by parts of the appliance supplying combustion air. Combustion air is drawn into the appliance from the room by means of a concentric duct, which encloses the flue. The air enters through defined orifices situated in the surface of the duct.

1.4.2.2.2.4 Type B_4

A type B boiler incorporating a draught diverter, that is designed for connection via its flue duct to its flue terminal

1.4.2.2.2.5 Type B_5

A type B boiler without a draught diverter, that is designed for connection via its flue duct to its flue terminal.

1.4.2.2.3 Presence and position of a fan

- A type B boiler that does not incorporate a fan is identified by the second subscript number “1” (e.g. B_{11}).
- A type B boiler that incorporates a fan downstream of the combustion chamber/ heat exchanger and upstream of the draught diverter, if any, is identified by the second subscript number “2” (e.g. B_{12}).

- A type B boiler that incorporates a fan upstream of the combustion chamber/ heat exchanger is identified by the second subscript number "3" (e.g. B_{23}).
- A type B boiler that incorporates a fan downstream of both the combustion chamber/ heat exchanger and the draught diverter is identified by the second subscript number "4" (e.g. B_{14})."

Add at the end of the last paragraph of the new clause 1.4.2.2.1 a new footnote as follows:

" This identification "P" is in accordance with the designation of the positive pressure classes of tightness, agreed by CEN/TC 166 "Chimneys", depending on the pressure of operation of the duct (e.g. see EN 1443)."

2.1.2 Materials and method of construction

2.1.2.1 General

Add before the penultimate paragraph a new paragraph as follows:

" For a separate combustion products evacuation duct which is supplied with a type B_4 or B_5 boiler, the requirements given in 2.1.2.5, in accordance with EN 1443 apply as well as the applicable requirements of EN 1856-1, prEN 1856-2 and EN 1859."

Add a new subclause 2.1.2.5, as follows:

"**2.1.2.5 Separate combustion products evacuation duct**

2.1.2.5.1 Stability under mechanical loading

The duct shall be capable of withstanding horizontal and vertical loads. The following aspects shall be considered:

- compressive strength;
- tensile strength;
- where applicable, resistance to lateral load for a reference wind velocity pressure of 1,5 kN/m^2.

2.1.2.5.2 Stability under exposure to heat

The stability of the walls of the duct shall be ensured during and after exposure to heat occurring under all operating conditions of the boiler.

2.1.2.5.3 Corrosion resistance

The duct shall keep its essential characteristics in the presence of the corrosion load corresponding to all operating conditions of the boiler.

2.1.2.5.4 Resistance to condensate and moisture under normal operating conditions

The duct shall keep its essential characteristics in the presence of condensate and moisture under normal operating conditions."

2.1.7 Supply of combustion air and evacuation of the combustion products

Replace the existing text by:

"**2.1.7.1 General**

The boiler shall be designed so that there is an adequate supply of combustion air during ignition and over the whole range of possible heat inputs declared by the manufacturer.

The boiler shall not be fitted with manual or automatic devices for the adjustment of the supply of combustion air and/or the evacuation of the combustion products, except for boilers in accordance with 2.1.7.2.2 and for boilers with gas/air ratio controls in accordance with 2.1.7.4 or control dampers in accordance with 2.1.7.5.

2.1.7.2 Connection to the combustion products evacuation system

2.1.7.2.1 Boilers with a draught diverter

The draught diverter shall be part of the boiler. Downstream of this draught diverter the boiler shall incorporate a female flue outlet that allows, if necessary by means of an adapter supplied with the boiler, connection to a flue pipe whose diameter complies with the standards or practices in force in the country where the boiler is to be installed (see A.3).

The operation of the boiler shall be tested with the appropriate flue sizes specified by the manufacturer.

It shall be possible to insert into the flue outlet or adapter of diameter *D* a flue pipe of external diameter (*D*-2) mm to a depth of at least *D*/4, but not so far that the evacuation of the combustion products is impaired. However, for a vertical connection, the depth of insertion may be reduced to 15 mm.

2.1.7.2.2 Boilers without a draught diverter

The combustion circuit of these boilers may be fitted with an adjusting device to adjust the boiler to pressure losses of the installation. This adjustment can be effected either by means of restrictors or by adjustment, which requires the use of tools, to a predetermined position given in the installation instructions.

The flue outlet shall be designed such that, if necessary by means of an adapter supplied with the boiler, it allows connection to a flue pipe whose diameter complies with the standards or practices in force in the country where the boiler is to be installed (see A.3). The connection shall not impair the evacuation of the combustion products.

2.1.7.3 Boilers with a fan

2.1.7.3.1 Fan

Direct access to the rotating parts of a fan shall be prevented. The parts of a fan in contact with combustion products shall be effectively protected against corrosion unless they are of corrosion resistant material; furthermore they shall withstand the temperature of the combustion products.

2.1.7.3.2 Proof of air flow

Except for boilers with gas/air ratio controls, before each fan start it shall be checked that there is no simulation of air flow in the absence of air flow.

The supply of combustion air shall be checked by one of the following methods:

- continuous supervision of the combustion air rate or the combustion products rate.
  In this system, the supervision device is activated directly by the flow of combustion air or combustion products. This is also valid for boilers with more than one fan speed in which the flows associated with each fan speed are monitored by separate supervision devices;
- gas/air ratio control.

Only for boilers where the combustion products circuit is completely surrounded by the air supply circuit the following two indirect supervision methods are also allowed:

- indirect supervision (e.g. fan speed supervision) when there is an air proving device which proves the supply of combustion air at least once at each start up;
- supervision of the minimum and maximum air or combustion products rates with two rate supervision devices, which prove the supply of combustion air at least once at each start up.

2.1.7.4 Boilers having a gas/air ratio control

Gas/air ratio controls shall be designed and constructed so that reasonably foreseeable damage does not give rise to a change capable of affecting safety.

Gas/air ratio controls of the mechanical type shall comply with the relevant requirements of EN 12067-1.