

D]bg_] [fYb]]nfU Ug'df]g]bc' _cbj Y_V]cžnUc[fYj Ub^YbYghUbcj Ub^g_] \
dfcglcfcj žn]a Ybg_c'a c ^c^Xc'j _`f bc" \$\$ _K žn]j Ybh]Urcf^Ya `nUn[cfYj Ub]nfU_
]b#U]dfcXi _hY'n[cfYj Ub^U

Non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW, incorporating a fan to assist transportation of combustion air and/or combustion products

STANDARD PREVIEW

Gasbefeuerte Warmlufterzeuger mit verstärkter Konvektion zum Beheizen von Räumen für den nicht-häuslichen Gebrauch mit einer Nennwärmebelastung nicht über 300 kW, mit Gebläse zur Beförderung der Verbrennungsluft und/oder der Abgase

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Générateurs d'air chaud a convection forcée utilisant les combustibles gazeux pour le chauffage de locaux autres que l'habitat individuel de débit calorifique inférieur ou égal a 300 kW (sur pouvoir calorifique inférieur), comportant un ventilateur pour aider l'alimentation en air comburant et/ou l'évacuation des produits de combustion

Ta slovenski standard je istoveten z: EN 1020:1997

ICS:

97.100.20 Plinski grelniki Gas heaters

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EUROPEAN STANDARD

EN 1020

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 1997

ICS 91.140.10

Descriptors: heaters, gas appliances, hot air generators, definitions, classifications, specifications, equipment specifications, performance evaluation, tests, combustion product discharge, safety, effectiveness, technical notices, marking

English version

Non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW, incorporating a fan to assist transportation of combustion air and/or combustion products

Générateurs d'air chaud à convection forcée utilisant les combustibles gazeux pour le chauffage de locaux autres que l'habitat individuel de débit calorifique inférieur ou égal à 300 kW (sur pouvoir calorifique inférieur), comportant un ventilateur pour aider l'alimentation en air comburant et/ou l'évacuation des produits de combustion

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This European Standard was approved by CEN on 29 October 1997.

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.

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.

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

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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1 SCOPE

This European Standard specifies the requirements and test methods for the safety and efficiency of non-domestic gas-fired air heaters having a fan to assist the transportation of combustion air and/or flue gases, hereafter referred to as "appliances". This includes appliances having forced draught burners.

This European Standard applies to Type B₁₂, B₁₃, B₁₄, B₂₂, B₂₃, C₁₂, C₁₃, C₃₂, C₃₃, C₆₂ and C₆₃ appliances with a heat input not exceeding 300 kW (based on net calorific value) intended for use in other than single unit residential dwellings. It also applies to appliances intended for outdoor installation. Provision of the heated air may be by means of ducting or may be directly into the heated space.

For Type B₂₂ appliances, this European Standard only applies to appliances having automatic ignition. For Type C₆₂ and C₆₃ appliances, this European Standard only applies when such appliances are intended for final installation in a similar manner to Type C₃ appliances.

This standard does not apply to:

- appliances intended for use in a single unit residential dwelling;
- appliances of the condensing type;
- appliances with atmospheric burners without a fan to assist the transportation of combustion air and/or flue gases;
- dual purpose air conditioning appliances (heating and cooling);
- appliances where the air is heated by an intermediate fluid;
- appliances fitted with manual or automatic flue dampers;
- portable or transportable forced convection appliances;
- appliances having multiple heating units with a single draught diverter;
- appliances fitted with more than one flue outlet.

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

NOTE: Requirements for appliances which are not type tested would need to be subject to further consideration.

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 179 "Gas-fired air heaters", the secretariat of which is held by NNI.

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 1998, and conflicting national standards shall be withdrawn at the latest by June 1998.

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 Annex ZA, which is an integral part of this standard.

This European Standard is applicable to appliances which are intended to be type tested. Requirements for appliances which are not intended to be type tested would need to be subject to further consideration.

The test gases, test pressures and appliance categories given in this Standard are in accordance with those specified in EN 437:1993 "Test gases - Test pressures - Appliance categories".

NOTE: For countries requesting special categories (specified in EN 437:1993), the absence of specific information concerning A.3.3 and A.3.4 implies that the general requirements described in the body of the standard (clauses 4.1.1, 4.2.2, 4.2.3 and 4.2.5) also apply to these special categories.

Work is in progress to look for a device to detect failure of the heat exchanger. If successful, this could be an alternative to the "heat exchanger thermal cycle" requirement, 5.1.7.

In preparation of this European Standard, it was recognized that these air heating appliances were likely to be fitted with forced draught burners complying with the European Standard for automatic forced draught burners (EN 676:1996). Given these circumstances, it was felt that it would be useful to identify requirements of this standard for which at least equivalent requirements are likely to be included in the burner standard. This information is given in Annex G.

Other European Standards covering gas-fired air heaters are as follows:

EN 525	Non-domestic direct gas-fired forced convection air heaters for space heating
EN 621	Non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW, without a fan to assist transportation of combustion air and/or combustion products
prEN 778	Domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 70 kW, without a fan to assist transportation of combustion air and/or combustion products
prEN 1196	Specific requirements for gas-fired condensing air heaters for domestic and non-domestic use
prEN 1319	Domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 70 kW, incorporating a fan to assist transportation of combustion air and/or combustion products
prEN 12669	Non-domestic gas-fired hot air blowers for agriculturalized and supplementary space heating including special requirements for use in greenhouses

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.

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.

EN 88:1991	Pressure governors for gas appliances for inlet pressures up to 200 mbar
EN 125:1991	Flame supervision devices for gas burning appliances - thermoelectric flame supervision devices
EN 126:1995	Multifunctional controls for gas burning appliances
EN 161:1991	Automatic shut-off valves for gas burners and gas burning appliances
EN 257:1992	Mechanical thermostats for gas burning appliances
EN 298:1993	Automatic gas burner control systems gas burners and gas burning appliances with or without fans
EN 437:1993	Test gases - Test pressures - Appliance categories
EN 676:1996	Forced draught burners for gaseous fuels
EN 23166:1993	Codes for the representation of names of countries (ISO 3166:1988)
prEN 50165:1993	Electrical equipment of non-electric heating appliances for household and similar appliances
EN 60335-1:1988	Safety of household and similar electrical appliances - Part 1: General requirements
EN 60529:1991	Degrees of protection provided by enclosures (IP code)
EN 60730-1:1991	Automatic electrical controls for household and similar general purposes - Part 1: General requirements
EN 60730-2:1992	Automatic electrical controls for household and similar use - Part 2: Particular requirements for electrical controls for electrical household appliances
EN 60730-2-9:1995	Automatic electrical controls for household and similar use - Part 2: Particular requirements for temperature-sensing controls
EN 61058-1:1992	Switches for appliances - Part 1: General requirements
IEC 479-1:1994	Effects of current passing through the human body - Part 1: General aspects
IEC 479-2:1987	Effects of current passing through the human body - Part 2: Special aspects
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 1182:1990	Fire tests - Building materials - Non-combustibility test
ISO 6976:1991	Natural gas - Calculation of the calorific value, the density and the relative density

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ISO 7005-1:1992 **Metallic flanges - Part 1: Steel flanges**
ISO 7005-2:1988 **Metallic flanges - Part 2: Cast iron flanges**
ISO 7005-3:1988 **Metallic flanges - Part 3: Copper flanges and composite flanges**

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3 DEFINITIONS

For the purposes of this standard, the following definitions apply:

3.1 Appliance and its constituent parts

3.1.1 non-domestic air heater: An appliance designed for the heating and possibly ventilation of a building other than a single unit residential dwelling.

3.1.2 forced convection air heater: An appliance designed to provide space heating from a central source by distributing heated air, by means of an air moving device, either through ducting or directly into the heated space.

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

3.1.4 mechanical joint; mechanical means of obtaining soundness: A means of assuring the soundness of an assembly of several (generally metallic) parts without the use of liquids, pastes, tapes, etc. There are, for example:

- metal to metal joints;
- conical joints;
- toroidal sealing rings ("O" rings);
- flat joints.

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

3.1.6 restrictor: A device with an orifice, 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.

3.1.7 gas rate adjuster: A component allowing an authorized person to set the gas rate of the burner to a predetermined value according to the supply conditions.

Adjustment may be progressive (screw adjuster) or in discrete steps (by changing restrictors).

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

The action of adjusting this device is called "adjusting the gas rate".

A factory sealed gas rate adjuster is considered to be non-existent.

3.1.8 setting an adjuster: Immobilization of an adjuster by some means such as a screw after the manufacturer or installer has adjusted it. The adjuster is said to be "set" in this position.

3.1.9 sealing an adjuster: Setting of an adjuster using a material such that any attempt to change the adjustment breaks the sealing material and makes the interference with the adjuster apparent. The adjuster is said to be "sealed" in its adjustment position.

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

A governor is considered to be non-existent if it has been factory sealed in a position such that it is not operational in the range of supply pressures corresponding to the appliance category.

3.1.10 putting an adjuster or a control out of service: Putting an adjuster or a control (of temperature, pressure, etc.) out of action and sealing it in this position. The appliance then functions as if the adjuster or control had been removed.

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

3.1.12 main burner: A burner that is intended to assure the thermal function of the appliance and is generally called the burner.

3.1.13 ignition device: Any means (flame, electrical ignition device or other device) used to ignite the gas at the ignition burner or at the main burner.

This device can operate intermittently or permanently.

3.1.14 ignition burner: A burner whose flame is intended to ignite another burner.

3.1.15 aeration adjuster: A device enabling the air to be set at the desired value according to the supply conditions.

The action of adjusting this device is called "adjusting the aeration".

3.1.16 Combustion products circuit

3.1.16.1 combustion chamber: An enclosure inside which combustion of the air-gas mixture takes place.

3.1.16.2 flue outlet: The part of a Type B appliance that connects with a flue to evacuate the products of combustion.

3.1.16.3 draught diverter: A device placed in the combustion products circuit to reduce the influence of flue-pull and that of down-draught on the burner performance and combustion.

3.1.16.4 flue damper: A manual or automatic device placed in the combustion products circuit intended to restrict or fully close off the passageways for the evacuation of products of combustion when the appliance is not in use.

3.1.16.5 flue terminal: A device fitted at the end of the duct system which enables the discharge of flue gases and may, at the same time, allow entry of combustion air.

3.1.16.6 C₆ flue terminal: A terminal which is specially approved for Type C₆ appliances.

3.1.16.7 flue adaptor box: A means of adapting the appliance for connection to different duct systems e.g. from concentric to separate ducts.

3.2 Adjusting, control and safety devices

3.2.1 range rating device: A component on the appliance intended to be used by the installer to adjust the heat input of the appliance, within a range of heat inputs stated by the manufacturer, to suit the actual heat requirements of the installation.

This adjustment may be progressive (e.g. by use of a screw adjuster) or in discrete steps (e.g. by changing restrictors).

3.2.2 automatic burner control system: A system comprising at least a programming unit and all the elements of a flame detector device. The various functions of an automatic burner control system may be in one or more housings.

3.2.3 programming unit: A device 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.

3.2.4 programme: The sequence of control operations determined by the programming unit involving switching on, starting up, supervising and switching off the burner.

3.2.5 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.

- 3.2.6 flame signal:** The signal given by the flame detector device, normally when the flame sensor senses a flame.
- 3.2.7 flame simulation:** A condition which occurs when the flame signal indicates the presence of a flame when in reality no flame is present.
- 3.2.8 pressure governor¹⁾:** A device which maintains the outlet pressure constant independent of the variations in inlet pressure and/or flow rate within defined limits.
- 3.2.9 adjustable pressure governor:** A governor provided with means for changing the outlet pressure setting.
- 3.2.10 flame supervision device:** A device that, in response to a signal from the flame detector, keeps the gas supply open and shuts it off in the absence of the supervised flame.
- 3.2.11 automatic shut-off valve:** A valve designed to open when energized and to close automatically when de-energized.
- 3.2.12 control thermostat:** A device controlling the operation of the appliance (by on/off, high/low or modulating control) and enabling the temperature to be kept automatically, within a given tolerance, at a predetermined value.
- 3.2.13 overheat cut-off device:** A device that shuts off and locks out the gas supply before the appliance is damaged and/or before safety is put into question, and that requires manual intervention to restore the gas supply.

This device is preset and sealed by the manufacturer (see 4.10.4).

- 3.2.14 overheat control device:** An automatic reset device that shuts down the gas supply to the burner when the temperature of the delivered air exceeds a certain preset value during abnormal operating conditions.
- 3.2.15 fan delay control:** A control that starts and/or stops the air delivery fan when the temperature of the delivered air reaches a certain predetermined value.
- 3.2.16 temperature sensing element; temperature sensor:** A component that detects the temperature of the environment to be supervised or controlled.
- 3.2.17 modulating control:** An automatic control by which the heat input of the appliance can be varied in a continuous manner between the nominal heat input and a minimum value.
- 3.2.18 high/low control:** An automatic control which permits an appliance to operate either at the nominal heat input or at a fixed reduced heat input.

3.3 Operation of the appliance

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

Symbol: V

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

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

Symbol: M

Units: kilograms per hour (kg/h), or grams per hour (g/h).

¹⁾ The term "governor" is used in this case and for a volume governor.