SLOVENSKI STANDARD
SIST EN 17082:2020

01-januar-2020

Nadomešča:
SIST EN 1020:2010
SIST EN 1196:2012
SIST EN 1319:2010
SIST EN 525:2009
SIST EN 621:2010
SIST EN 778:2010

Plinski grelniki zraka s prisilno konvekcijo za gretje stanovanjskih in nestanovanjskih prostorov z nazivno močjo do vključno 300 kW

Domestic and non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW

Häusliche und nicht-häusliche gasbefeuerte Warmlufterzeuger mit erzwungener Konvektion zur Raumbeheizung deren Nennwärmebelastung 300 kW nicht übersteigt

Générateurs d'air chaud à convection forcée utilisant les combustibles gazeux pour le chauffage de locaux à usage domestique et non domestique, de débit calorifique inférieur ou égal à 300 kW, sur pouvoir calorifique inférieur (PCI)

Ta slovenski standard je istoveten z: **EN 17082:2019**

ICS:

97.100.20	Plinski grelniki	Gas heaters

SIST EN 17082:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17082

October 2019

ICS 97.100.20

Supersedes EN 1020:2009, EN 1196:2011, EN 1319:2009, EN 525:2009, EN 621:2009, EN 778:2009

English Version

Domestic and non-domestic gas-fired forced convection air heaters for space heating not exceeding a net heat input of 300 kW

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This European Standard was approved by CEN on 5 June 2019.

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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 CEN-CENELEC Management Centre has the same status as the official versions.

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

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Ref. No. EN 17082:2019 E

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European foreword

This document (EN 17082:2019) has been prepared by Technical Committee CEN/TC 180 “Decentralized gas heating”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2020, and conflicting national standards shall be withdrawn at the latest by April 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 525:2009, EN 621:2009, EN 778:2009, EN 1196:2011, EN 1020:2009 and EN 1319:2009.

This document covers the safety and energy efficiency requirements of domestic and non-domestic warm air heaters previously covered by EN 525:2009, EN 621:2009, EN 778:2009, EN 1196:2011, EN 1020:2009 and EN 1319:2009. Additional technical requirements have been made compared to the superseded documents to take account the following:

— Specific requirements on risk analysis due to differences in the Essential Requirements for the Gas Appliance Regulation compared to those of the Gas Appliance Directive;

— Additional requirements on appliance efficiency, including the need to calculate the seasonal efficiency related to the requirements of the Eco-Design Regulation.

Changes have also been made to the document structure to improve its ease of use, for example requirements and associated test methods have been moved into the same clause.

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 organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the requirements and test methods for the safety and efficiency of gas fired air heaters with or without a fan to assist the transportation of combustion air and/or flue gases, hereafter referred to as "appliances".

This document also applies to warm air heaters having forced draught burners.

This document applies to Type A_2, A_3 appliances, with an input not exceeding 300 kW (net CV basis), intended for non-domestic use.

This document also applies to Type B_{11}, B_{11AS}, B_{11BS}, B_{12}, B_{12AS}, B_{12BS}, B_{13}, B_{13AS}, B_{13BS}, B_{14}, B_{14AS}, B_{14BS}, B_{22}, B_{23}, B_{41}, B_{41AS}, B_{41BS}, B_{42}, B_{42AS}, B_{42BS}, B_{43}, B_{43AS}, B_{43BS}, B_{44}, B_{44AS}, B_{44BS}, B_{52}, B_{53}, C_{11}, C_{12}, C_{13}, C_{21}, C_{31}, C_{32}, C_{33}, C_{41}, C_{62} and C_{63} appliances with an input not exceeding 300 kW (net CV basis), intended for domestic and non-domestic use.

Provision of the heated air may be by means of ducting.

This document does not apply to:

a) dual purpose air conditioning appliances (heating and cooling);

b) appliances where the air is heated by an intermediate fluid;

c) portable or transportable forced convection appliances;

d) appliances fitted with manual or automatic means of adjusting the combustion products evacuation by means of flue dampers;

e) appliances having multiple heating units with a single draught diverter;

f) appliances fitted with more than one flue outlet;

g) appliances fitted with gas boosters;

h) C_{21} and C_{41} appliances for 3rd family gases.

NOTE For C_{41} appliances, see all requirements and test methods that are valid for C_{21} appliances, unless otherwise stated.

This document is not intended to cover appliances projected for connection to gas grids where the quality of the distributed gas is likely to vary to a large extent over the lifetime of the appliance.

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

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 88-1:2011+A1 2016, *Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

EN 125:2010+A1 2015, *Flame supervision devices for gas burning appliances — Thermoelectric flame supervision devices*

EN 126:2012, *Multifunctional controls for gas burning appliances*

EN 161:2011+A3:2013, *Automatic shut-off valves for gas burners and gas appliances*

EN 257:2010, *Mechanical thermostats for gas-burning appliances*

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

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

EN 676:2003+A2:2008, *Automatic forced draught burners for gaseous fuels*

EN 682:2002, *Elastomeric seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

EN 1859:2009+A1:2013, *Chimneys— Metal chimneys — Test methods*

EN 10226-2:2005, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

EN 12067-2:2004, *Gas/air ratio controls for gas burners and gas burning appliances — Part 2: Electronic types*

EN 50090 *(all parts), Home and Building Electronic Systems (HBES)*

EN 60335-1:2012, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1:2010, modified)*

EN 60335-2-102:2016, *Household and similar electrical appliances — Safety - Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

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

EN 60584-1:2013, *Thermocouples — Part 1: EMF specifications and tolerances (IEC 60584-1:2013)*

EN 60730-1:2016, *Automatic electrical controls — Part 1: General requirements (IEC 60730-1:2013, modified)*

EN 60730-2-9:2010, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9:2008, modified)*

EN 61058-1:2002, *Switches for appliances — Part 1: General requirements (IEC 61058-1:2000, modified)*

EN 61558-2-6:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V — Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers (IEC 61558-2-6:2009)*

EN 61558-2-16:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V — Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units (IEC 61558-2-16:2009)*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 1182:2010, *Reaction to fire tests for products — Non-combustibility test (ISO 1182:2010)*

EN ISO 3166-1:2014, *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes (ISO 3166-1:2013)*

EN ISO 5167-1:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 1: General principles and requirements (ISO 5167-1:2003)*

EN ISO 5167-2:2003, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full — Part 2: Orifice plates (ISO 5167-2:2003)*

ISO 3966:2008, *Measurement of fluid flow in closed conduits – Velocity area method using Pitot static tubes*

ISO 7005-1:2011, *Pipe flanges — Part 1: Steel flanges for industrial and general service piping systems*

ISO 7005-2:1988, *Metallic flanges — Part 2: Cast iron flanges*

ISO 7005-3:1988, *Metallic flanges — Part 3: Copper alloy and composite flanges*

3 Terms and definitions

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions 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

3.1.1 Appliance and its constituent components

3.1.1.1
air heater
appliance designed for the heating by means of warm air and possibly ventilation of a building

3.1.1.2
forced convection air heater
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

3.1.1.3
direct fired forced convection air heater
forced convection air heater in which the products of combustion mix with the heated air being supplied to the space

3.1.1.4
high temperature direct fired forced convection air heater
direct fired forced convection air heater designed to operate with an air temperature rise through the appliance greater than 60 K

3.1.1.5
low temperature direct fired forced convection air heater
direct fired forced convection air heater designed to operate with a maximum air temperature rise through the appliance of 60 K or less

3.1.1.6
appliance with facility for downstream re circulation of air
appliance in which a proportion of the heated air can be returned to the appliance at a point downstream of the burner and re distributed

3.1.1.7
appliance with facility for upstream re circulation of air
appliance in which a proportion of the heated air can be returned to the appliance at a point upstream of the burner and re distributed

3.1.1.8
profile plates
fixed or adjustable plates fitted for the purpose of setting the air flow velocity across the burner

3.1.1.9
gas inlet connection
part of the appliance intended to be connected to the gas supply

3.1.1.10
mechanical joint
mechanical means of ensuring the soundness of an assembly of several (generally metallic) parts without the use of liquids (e.g. pastes and tapes)

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

3.1.1.11
gas circuit
part of the appliance/burner that conveys or contains the gas between the appliance/burner gas inlet connection and the burner(s)

3.1.1.12
restrictor
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

3.1.1.13
gas rate adjuster
component allowing the gas rate of the burner to be set to a predetermined value according to the supply conditions

Note 1 to entry: Adjustment may be progressive (screw adjuster) or in discrete steps (by changing restrictors).

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

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

Note 4 to entry: A factory sealed gas rate adjuster is considered to be non-existent.

3.1.1.14
setting an adjuster
immobilizing of an adjuster [1]after the gas rate has been adjusted

Note 1 to entry: By means such as a screw

3.1.1.15
sealing an adjuster
arrangement[2] made to make evident any attempt to change its adjustment putting an adjuster or a control out of service

Note 1 to entry: Breakage of a device or of a sealing material.

3.1.1.16
injector
component that admits the gas into a burner

3.1.1.17
main burner
burner that is intended to assure the thermal function of the appliance

3.1.1.18
forced draught burner
burner in which the combustion air is introduced by means of a fan

3.1.1.19
ignition device
any means (e.g. flame, electrical ignition device or other device) used to ignite the gas at the ignition burner or at the main burner

Note 1 to entry: This device can operate intermittently or permanently.

3.1.1.20
ignition burner
burner whose flame is intended to ignite another burner

3.1.1.21
permanent ignition burner
ignition burner that operates continuously throughout the whole period that the appliance is in use

3.1.1.22
intermittent ignition burner
ignition burner that is ignited before and extinguished at the same time as the main burner

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[1] by means such as a screw.
[2] breakage of a device or of a sealing material.

3.1.1.23
alternating ignition burner
ignition burner that is extinguished as soon as ignition of the main burner is effected, and that re-ignites at the main burner flame just before the latter goes out

3.1.1.24
interrupted ignition burner
ignition burner that operates only during the ignition sequence

3.1.1.25
aeration adjuster
device enabling the combustion air flow rate to be set at the desired value according to the supply conditions

Note 1 to entry: The action of adjusting this device is called "adjusting the aeration".

3.1.1.26
combustion circuit
circuit from the air inlet to the combustion products outlet of the appliance

Note 1 to entry: This will include the combustion chamber and heat exchanger and depending on the type includes the air supply duct, the combustion products evacuation duct, the fitting piece, the connection to the terminal, the inlet terminal, the outlet terminal.

3.1.1.27
air supply duct
means of transporting combustion air to the burner

3.1.1.28
combustion chamber
enclosure inside which combustion of the air-gas mixture takes place

3.1.1.29
flue outlet
part of a Type B appliance that connects with a flue to evacuate the products of combustion

3.1.1.30
draught diverter
device placed in the combustion circuit to reduce the influence of flue-pull and that of down-draught on the burner performance and combustion

3.1.1.31
flue damper
manual or automatic device placed in the POCED intended to restrict or fully close off the passageways for the evacuation of products of combustion when the appliance is not in use

3.1.1.32
flue terminal
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

3.1.1.33
C_6 flue terminal
terminal which is specially approved for Type C_6 appliances

3.1.1.34
terminal guard
device that protects the terminal from mechanical damage from outside influences

3.1.1.35
flue adaptor box
means of adapting the appliance for connection to different duct systems

EXAMPLE From concentric to separate ducts.

3.1.1.36
POCED
combustion products evacuation duct that is intended to be used only with a specific appliance/system, this duct being either supplied with the appliance/system or specified in the manufacturer's instructions

3.1.1.37
fully premixed burner
pre-aerated burner system in which gas is mixed in a pre-determined and adjustable ratio with all of the air necessary for combustion

3.1.1.38
gas/air ratio control
device that automatically adapts the combustion air rate to the gas rate and vice versa

3.1.2 Adjustment, control and safety devices

3.1.2.1
range rating device
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 in the installation instructions, to suit the actual heat requirements of the installation

Note 1 to entry: This adjustment may be progressive (e.g. by use of a screw adjuster) or in discrete steps (e.g. by changing restrictors).

3.1.2.2
automatic burner control system
system comprising a programming unit and all the elements of a flame detector device

Note 1 to entry: The various functions of an automatic burner control system may be in one or more housings.

[SOURCE EN 298:2012]

3.1.2.3
programming unit
device which executes the program reacting 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.

[SOURCE EN 298:2012, Modified]

3.1.2.4
flame detector device
device by which the presence of a flame is detected and signalled

Note 1 to entry: A flame detector device 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.

[SOURCE EN 298:2012]

3.1.2.5
flame signal
signal given by the flame detector device, normally when the flame sensor senses a flame

[SOURCE EN 298:2012, modified]

3.1.2.6
pressure regulator
device which maintains the outlet pressure constant independent of the variations in inlet pressure and/or flow rate within defined limits

3.1.2.7
adjustable pressure regulator
regulator provided with means for changing the outlet pressure setting

3.1.2.8
volume regulator
device which maintains the gas rate constant within a given tolerance, independent of the upstream pressure

3.1.2.9
flame supervision device
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

3.1.2.10
automatic shut-off valve
valve designed to open when energized and to close automatically when de energized

3.1.2.11
control thermostat / room temperature control thermostat
device controlling the operation of the appliance (by on/off, high/low or modulating control) and enabling the room temperature to be kept automatically, within a given tolerance, at a predetermined value

3.1.2.12
overheat cut-off device
device that causes safety shutdown and non-volatile lockout at a pre-set value before the appliance is damaged and/or before safety is put in question

3.1.2.13
overheat limit device
device which is intended to keep a temperature below one particular value during abnormal operation conditions and which has either no provision for setting or is provided with a maximum temperature limit stop

Note 1 to entry: The overheat limit device can be of the automatic or the manual reset type.

3.1.2.14
fan control / fan delay control
control that starts and/or stops the air delivery fan when the temperature of the delivered air reaches certain predetermined values

3.1.2.15
temperature sensing element / temperature sensor
component that detects the temperature of the environment to be supervised or controlled

3.1.2.16
combustion products discharge safety system
system that automatically shuts off the gas supply to the main burner, and perhaps to the ignition burner, when spillage of combustion products from the draught diverter is detected

3.1.2.17
atmosphere sensing device
device designed to shut off the gas supply before the concentration of combustion products of the surrounding atmosphere reaches a set value

3.1.2.18
modulating control
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

3.1.2.19
high/low control
automatic control which permits an appliance to operate either at the nominal heat input or at a fixed reduced heat input

3.1.2.20
vent valve
normally open automatic valve fitted between two automatic shut off valves and intended to vent any small leakages of gas

3.1.2.21
air flow proving device
device which monitors and proves the existence of an adequate flow of air for combustion and, where appropriate, for dilution

3.1.2.22
closed position indicator switch
switch fitted to an automatic shut-off valve which indicates when the closure member is in the closed position

3.1.2.23
proof of closure switch
switch fitted to an automatic shut-off valve with mechanical overtravel which indicates when the closure member is in the closed position

3.1.2.24
valve proving system
system to check the effective closure of the start gas or main gas safety shut off valves, and which is capable of detecting small gas leakage rates (e.g. by means of a pressure or vacuum proving system)

3.1.3 Operation of the appliance

3.1.3.1
volume flow rate
volume of gas consumed by the appliance in unit time during continuous operation

Note 1 to entry The volume flow rate is expressed in 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).

[SOURCE EN 437:2003+A1:2009]

3.1.3.2
mass flow rate
mass of gas consumed by the appliance in unit time during continuous operation

Note 1 to entry: The mass flow rate is expressed in kilograms per hour (kg/h) or grams per hour (g/h).

[SOURCE EN 437:2003+A1:2009]

3.1.3.3
heat input
quantity of energy used in unit time corresponding to the volumetric or mass flow rates, the calorific value used being the net or gross calorific value

Note 1 to entry: The heat input is expressed in kilowatts (kW).

[SOURCE EN 437:2003+A1:2009]

3.1.3.4
nominal heat input
value of the heat input declared by in the installation instructions

Note 1 to entry: The nominal heat input is expressed in kilowatts (kW).

[SOURCE EN 437:2003+A1:2009, modified]

3.1.3.5
flame stability
characteristic of flames which remain on the flame ports or in the flame reception zone intended by the construction