SLOVENSKI STANDARD

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Specifikacija za plinske aparate na utekoļ injeni naftni plin ï Mobilni in prenosni plinski grelniki zraka brez prenosnika toplote, s prisilno konvekcijo, za nestanovanjske prostore

Specification for dedicated liquefied petroleum gas appliances - Mobile and portable non-domestic forced convection direct fired air heaters

Festlegungen für Flüssiggasgeräte - Ortsveränderliche und tragbare, nicht für den Hausgebrauch bestimmte Warmlufterzeuger ohne Wärmeaustauscher mit erzwungener Konvektion

Spécifications pour les appareils fonctionnant exclusivement aux gaz de pétrole liquéfiés - Générateurs d'air chaud a gaz, non domestiques, a chauffage direct et convection forcée, mobiles et portatifs

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English version

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This European Standard was approved by CEN on 23 May 1998.

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.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 181 "Dedicated liquefied petroleum gas appliances", the secretariat of which is held by NSAI.

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of an identical text or by endorsement, at the latest by December 1998, and conflicting national standards shall be withdrawn at the latest by December 1998.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 informative Annex ZA, which is an integral part of this standard.

Particular attention should be paid to the suitability of non-metallic materials used in the construction of these appliances. A European Standard for 'Flexible hose, tubing and assemblies for use with propane and butane in the vapour phase' is being prepared by CEN/TC 218. These standards will be applicable to these types of appliances.

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.

1 Scope

This standard defines, for the purpose of type examination, the construction, the safety characteristics, the test methods and the marking of mobile and portable non-domestic forced convection direct fired air heaters with a rated heat input not exceeding 180 kW (H_S) and burning 3rd family gases, referred to in the body of the text as 'appliances'.

This standard covers the following type of mobile and portable non domestic forced convection direct fired air heaters of type A_3 (see CR 1749) fitted with an integral burner intended for use in other than residential dwellings:

a) low gas pressure appliances operating at pressures up to and including 50 mbar burningcommercial butane and/or commercial propane;

b) medium gas pressure appliances operating at pressures above 50 mbar and up to 4,0 bar burning commercial butane and/or commercial propane.

It does not apply to appliances which are intended to be fixed or permanently installed, or to appliances which incorporate liquid feed burners.

Requirements for appliances given in this standard assume that the supply of gas from the gas cylinder will be governed by a pressure regulator. These appliances are not equipped with an appliance governor.

Requirements for controls, given herein, relate to controls fitted as part of, or supplied with, particular appliances; they do not necessarily provide a complete specification for controls intended for general use.

This Standard does not cover cylinders for liquefied petroleum gases or their associated regulators.

There are no specific thermal efficiency requirements appropriate to these types of appliances as:

c) all the heat produced by the combustion process is released into the space to be heated;

d) the requirements with regard to the combustion performance, which is a safety matter, ensure the effective burning of the fuel gas.

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 publication 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 125	Flame supervision devices for gas burning appliances - Thermo-electric flame supervision devices
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 gas burner control systems for gas burners and gas burning appliances with or without fans
EN 437	Test gases - Test pressures - Appliance categories
prEN 1106	Manually operated taps for gas burning appliances
EN 50165	Electrical equipment of non-electric appliances for household and similar purposes - Safety requirements
EN 60529	Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)
EN 60335-1	Safety of household and similar electrical appliances - Part 1: General requirements (IEC 60335-1:1991, modified)
EN 60730-2-1	Automatic electrical controls for household and similar use Part 2: Particular requirements for electrical controls for electrical household appliances (IEC 60730-2-1:1989, modified)
EN 60730-2-9	Automatic electrical controls for household and similar use - Part 2: Particular requirements for temperature sensing controls (IEC 60730-2-9:1992, modified)
IEC 34-5	Rotating machines - Part 5: Classification of degrees of protection provided by enclosures of rotating electrical machines
CR 1749	European Scheme for the classification of gas appliances according to the method of evacuation of the products of combustion (types)

3 Definitions

For the purpose of this standard the following definitions apply:

3.1 air proving device: A device which monitors and proves the existence of an adequate flow of air for combustion and, where appropriate, for dilution.

3.2 automatic burner control system: A system that comprises a programming unit and all the elements of a flame detector. All the functions of an automatic burner control system may be assembled in one or more housings.

3.3 auxiliary equipment: Auxiliary equipment includes timers, thermostats etc.

3.4 air delivery temperature: The maximum temperature of outlet air measured in an arc of 1,5 m from the appliance outlet.

3.4.1 space heating appliance: An appliance whose air delivery temperature does not exceed the ambient by more than 80 K.

3.4.2 commercial drying appliance: An appliance whose air delivery temperature may exceed the ambient by more than 80 K. These appliances are intended for purposes other than space heating.

3.5 automatic appliance: An appliance which incorporates a programmed and controlled ignition, start-up and protection system which is initiated by a single signal. e.g. the operation of a switch.

3.6 automatic valve: A device that automatically opens, closes or varies a rate on a signal from the control circuit and/or the safety circuit.

3.7 manual appliance: An appliance in which the necessary steps to achieve ignition and operation are controlled separately by the operator.

3.8 burner: A component that allows the gas to burn.

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

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

3.9 gross calorific value (H_s): The quantity of heat produced by the combustion, at constant pressure, of unit volume or mass of the considered gas, the water produced by the combustion being condensed. It is expressed in megajoules referred either per 1 m^3 of dry gas measured at 15 ^oC at a pressure of 1 013,25 mbar or to 1 kg of dry gas.

3.10 cold condition: A condition of the appliance required for some tests and obtained by allowing the unlit appliance to attain equilibrium at room temperature.

3.11 competent person: A person who is qualified by training or experience to carry out a specified task.

3.12 conversion: An operation carried out by a competent person at the time of a change of gas.

3.13 direct fired air heater: An air heater in which the products of combustion mix with the heated air being supplied to the space.

3.14 extinction delay time: For a thermoelectric flame supervision device, the time that elapses between disappearance of the supervised flame and the interruption of the gas supply.

3.15 extinction safety time: For automatic burner control units, the time that elapses between extinction of the supervised flame and the signal to shut-off the gas supply to the burner.

3.16 flame lift: Phenomenon charactertised by the partial or total lifting of the base of the flame away from the burner port, or the flame holding zone provided by the design.

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

3.18 gas circuit: An assembly of parts of the appliance that carry or contain the combustion gas between the appliance gas inlet connection and the burner.

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

3.20 gas pressure: All the pressures are static pressures of the moving gas, relative to the atmospheric pressure, measured at right angles to the directions of the flow of the gas.

Unit: millibars (mbar).

3.21 gas rate adjuster: A device allowing the gas rate to a burner to be set at a predetermined value according to the supply conditions. It often consists of a screw, termed a 'throttle screw' or an 'adjustment screw'. The operation of changing the setting of this device is termed the 'adjustment of the gas rate'. The adjustment screw of a variable regulator is regarded as a gas rate adjuster.

3.22 gas supply pressure: The difference between the static pressure measured at the inlet connection of the appliance and the atmospheric pressure.

3.23 heat input: The product of the volume or mass rate and the calorific value of the gas (brought to the same reference conditions).

Unit: Kilowatt

3.24 hot condition: A condition of the appliance required for some tests and obtained by heating to thermal equilibrium at the nominal heat input specified by the manufacturer, any thermostat remaining fully open.

3.25 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.

3.26 ignition opening time: For thermoelectric flame supervision device, the time that elapses
between ignition of the supervised flame and the moment when the closure element is held open by the flame signal.

3.27 ignition ratio: The ratio of the nominal heat input of the ignition burner to the nominal heat input of the main burner.

3.28 ignition safety time: For automatic burner control units, the time that elapses between the signal to open and the order to close the gas supply in the burner in the event of ignition not taking place.

3.29 injector: A component that admits the gas into an aerated burner.

3.30 light back: Phenomenon characterized by the return of the flame inside the body of the burner.

3.31 limit gas: Test gases representative of the extreme variations in the characteristics of the gases for which the appliance have been designed.

3.32 multifunctional control: A device having at least two functions, one of which is a shut-off function, integrated in one housing, whereby the functional parts cannot operate if separated.

3.33 mobile heater: A self-contained heater for connection to a gas supply by means of flexible tubing and designed to be moved without lifting.

3.34 nominal heat input of burner: The value of the heat input of the burner, as declared by the manufacturer at the nominal operating pressure.

Unit: Kilowatt

3.35 overheat cut-off device: A device that causes safety shutdown and non-volatile lockout so as to prevent the air temperature exceeding a present limit.

3.36 portable heater: A self-contained heater for connection to a gas supply by means of flexible tubing and designed to be easily carried.

3.37 pressure couple: Two related pressures which will give the same heat input on the same injector on butane and propane at their respective pressures.

3.38 pressure regulator: A device which is not part of the appliance, but which maintains an outlet pressure within preset limits whatever the upstream pressure, the rate and the temperature.

3.39 primary air adjuster: A device allowing the aeration of a burner to be set at a predetermined value according to the supply conditions. The operation of changing the setting of this device is termed the 'adjustment of primary air'.

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

3.41 purge: The mechanical introduction of air into the combustion circuit in order to displace any gas/air mixture which could remain there.

3.42 reference conditions: Dry gas at a temperature of 15 °C and at an absolute pressure of 1 013,25 mbar.

3.43 reference gas: Test gas on which appliances operate under nominal conditions when they are supplied at the corresponding normal pressure.

3.44 relative density: The ratio of the mass of a volume of dry gas to an equal volume of dry air under the same temperature and pressure conditions.

3.45 restrictor: A device with a calibrated orifice which is placed in the gas circuit to create a pressure loss and thus reduce the gas pressure at the burner to a predetermined value, for a given supply pressure and rate.

3.46 safety shutdown: The process which is initiated immediately in response to the signal of a limiting device or sensor and which causes the burner to shut down; the appliance returns to its start position.

3.46.1 non-volatile lockout: A shutdown condition such that a restart can only be accomplished by a manual reset.

3.46.2 volatile lockout: A shutdown condition such that a restart can only be accomplished by restoration of the electrical supply after its loss.

3.47 sealing an adjuster: An action whereby the locking of an adjuster is achieved by a means such that any attempt to change the adjustment makes the interference with the adjuster apparent (e.g. breaking of a sealing material).

3.48 setting and locking an adjuster: An action whereby an adjuster, after having been set by the manufacturer is immobilized in this position by an effective means (screw, plug etc).

3.49 setting pressure: The gas pressure measured at the inlet of the appliance that is required to obtain the rated heat input using the reference test gas.

3.50 soft solder: Solder for which the lowest temperature of the melting range, after application, is less than 450 °C.

3.51 sound mechanical joint: A connection device assuring gas soundness in an assembly made up of several parts, generally of metal.

It may be:

a conical joint;
an O-ring joint;
a flat-faced joint;
a nut and olive joint;
a cone seated union;
a flat-faced washered union.

3.52 flame stability: Condition of the flame at the burner port when the phenomena of flame lift or light back does not occur.

3.53 tap: A type of valve on an appliance that controls the flow of gas to the various burners and adjusts their rate during use.

3.54 thermostat: A device to maintain automatically a selected constant temperature.

3.55 volume or mass rate:

3.55.1 volume rate: the volume of gas passed in unit time. This is expressed in cubic metres per hour or in cubic decimetres per hour.

3.55.2 mass rate: the mass of gas passed in unit time. This is expressed in kilograms per hour or grams per hour.

3.56 Wobbe number: This is given by the formula:

$$W_s = \frac{H_s}{\sqrt{d}}$$

where H_S is the gross calorific value of a gas expressed in megajoules per cubic metre, and d is its relative density.

3.57 yellow tipping: Phenomenon characterised by the appearance of yellow colouring at the top of the blue cone of an aerated flame.

3.58 country of destination

3.58.1 direct country of destination: Country for which the appliance has been certified and which is specified by the manufacturer as the intended country of destination. At the time of putting the appliance on the market and/or installation, the appliance shall be capable of operating, without adjustment or modification, with one of the gases distributed in the country concerned, at the appropriate supply pressure. More than one country can be specified if the appliance, in its current state of adjustment, can be used in each of these countries.

3.58.2 indirect country of destination: A country for which the appliance has been certified, but for which, in its present state of adjustment, is not suitable. Subsequent modifications or adjustments are essential in order that it can be utilised safely and correctly in that country.

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

3.60 transportable heater: A self-contained heater for connection to a gas supply by means of flexible tubing and designed to be moved by using special equipment.

4 Classification

4.1 Classification of gases

Gases are classified in families according to the value of their Wobbe number, in accordance with EN 437, as shown in Table 1.