SLOVENSKI STANDARD

SIST EN 12309-1:1999

01-december-1999

Absorpcijske in adsorpcijske klimatske naprave in/ali toplotne ļ rpalke s plinskim ogrevanjem z grelno moļ jo do vkljuļ no 70 kW ï 1. del: Varnost

Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW - Part 1: Safety

Gasbefeuerte Absorptions- und Adsorptions-Klimageräte und/oder Wärmepumpengeräte mit einer Nennwärmebelastung nicht über 70 kW - Teil 1: Sicherheit

Appareils de climatisation et/ou pompes à chaleur à ab- et ad-sorption fonctionnant au gaz de débit calorifique sur PCI inférieur ou égal a 70 kW - Partie 1: Sécurité

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Gas-fired absorption and adsorption air-conditioning and/or heat pump appliances with a net heat input not exceeding 70 kW - Part 1: Safety

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This European Standard was approved by CEN on 27 November 1998.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 299 "Gas-fired sorption appliances and domestic gas-fired washing and drying appliances", the secretariat of which is held by AENOR.

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of an identical text or by endorsement, at the latest by January 2000, and conflicting national standards shall be withdrawn at the latest by January 2000.

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.

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.

CEN/TC 299 intends to prepare an amendment to this European Standard for appliances that fall within the scope of EU Directive 97/23/EEC, in order to address its essential requirements.

Requirements and methods of test covering rational use of energy for gas-fired absorption and adsorption air-conditioning and/or heat pump appliances are in the course of preparation and will be published as EN 12309-2.

1 Scope

This European standard specifies the requirements and test methods for the safety of gas-fired absorption and adsorption air-conditioning and/or heat pump appliances having a net heat input not exceeding 70 kW, hereafter referred to as "appliances".

This standard applies to appliances having flue systems of Type B_{12}, B_{12BS}, B_{13}, B_{13BS}, B_{14}, B_{22}, B_{23}, C_{12}, C_{13}, C_{32} and C_{33}, and to appliances designed for outdoor installations.

This standard only applies to appliances having:

- integral burners under the control of fully automatic burner control systems;
- closed system refrigerant circuits in which the refrigerant does not come into direct contact with the water or air to be cooled or heated;
- mechanical means to assist transportation of the combustion air and/or the flue gases.

Appliances covered by this standard include one or a combination of the following:

- Gas-Fired Absorption Air Conditioner;
- Gas-Fired Adsorption Air Conditioner;
- Gas-Fired Absorption Heat Pump;
- Gas-Fired Adsorption Heat Pump.

The above appliances may have one or more primary or secondary functions (see 3.1.5 and 3.1.6) and this standard applies to all such functions providing that the function concerned is dependent on circulation of fluid within the absorption, or adsorption, refrigerant circuit.

NOTE: Any appliance function that is not dependent on circulation of the fluid within the absorption, or adsorption, refrigerant circuit should be assessed separately.

This standard does not apply to appliances fitted with more than one flue outlet.

This standard is applicable to appliances that are intended to be type tested. Requirements for appliances that are not type tested would need to be subject to further consideration.

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 lastest edition of the publication referred to applies.

EN 88: 1991	Pressure governors for gas appliances for inlet pressures up to 200 mbar
EN 126: 1995	Multifunctional controls for gas burning appliances
EN 161: 1991	Automatic shut-off valves for gas burners and gas appliances
EN 257: 1992+A1: 1996	Mechanical thermostats for gas - burning appliances
EN 298: 1993	Automatic gas burner control systems gas burners and gas burning appliances with or without fans
prEN 378-3:1994	Refrigerating systems and heat pumps. Safety and environmental requirements - Part 3: classification of refrigeranting systems, occupancies and refrigerants
EN 437: 1993	Test gases - Test pressures - Appliance categories
EN 50165: 1997	Electrical equipment of non-electric heating appliances for household and similar purposes – Safety requirements
EN 60335-1: 1995	Safety of household and similar electrical appliances - Part 1: General requirements
EN 60529: 1991	Degrees of protection provided by enclosures (IP code) (IEC 60529: 1989)
EN 60730-2-9:1995	Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9: 1992, modified)
EN ISO 3166-1: 1997	Codes for the representation of names of countries – Part 1: Country codes (ISO 3166-1: 1997)
CR 1749: 1995	European scheme for the classification of gas appliances according to the method of evacuation of the products of combustion (types)
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 274: 1975	Copper tubes of circular section – Dimensions.
ISO 1182: 1990	Fire tests - Building materials - Non-combustibility test
ISO 3864: 1984	Safety colours and safety signs.

ISO 6976: 1995	Natural gas - Calculation of calorific values, density, relative density and Wobbe index from composition
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 alloy and composite flanges.

3 Definitions

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

3.1 Appliance and its constituent parts

3.1.1 air-conditioning appliance: appliance which is capable of providing full air conditioning (i.e. cooling, heating and humidity control); or which only provides the cooling and possibly the heating functions.

3.1.2 chiller: Air conditioning appliance utilizing an absorption or adsorption refrigerant cycle which is designed to provide cooling as a primary function and may provide heating as a secondary function.

3.1.3 chiller/Heater: Air-conditioning appliance utilizing an absorption or adsorption refrigerant cycle which is designed to provide cooling and heating, both as primary functions.

3.1.4 heat pump appliance: Heating appliance utilizing a refrigerant to extract heat from one medium (e.g. air, water, etc.) and transfer it to a second medium (e.g. air, water, etc.) at a higher temperature in order to contribute to the heating function of the appliance.

3.1.5 primary function: Main purpose for which the air conditioning or heat pump appliance is designed. In the case of an air conditioning appliance this is normally the cooling function. In the case of a heat pump this is normally the heating function. (Both the heating and cooling functions of the appliance may be classed as primary functions if they satisfy the rational use of energy requirements[1] for those functions.)

3.1.6 secondary function: Optional function of the appliance, such as heating or cooling, which is not expected to satisfy the rational use of energy requirements of a primary function.

3.1.7 open system: System in which the fluid (e.g. water, ammonia, etc.) which provides heating or cooling comes into direct contact with the fluid (e.g. water, air, etc.) which is to be heated or cooled.

3.1.8 closed system: System in which the fluid within the refrigerant circuit (e.g. water, ammonia, etc.) which provides heating or cooling does so without coming into contact with the surrounding air and with the heat transfer medium (e.g. water, brine, air).

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[1] See prEN 12309-2 which is in the course of preparation.

3.1.9 heat transfer medium: Any medium (e.g. air, water, brine, etc.) used for the transfer of heat to or from refrigerant-containing parts of the appliance; it may be:

- the cooling medium circulating in the evaporator;
- the cooling medium circulating in the condenser or absorber;
- the heat recovery medium circulating in the heat recovery heat exchanger.

3.1.10 brine: Liquid that has a freezing point depressed relative to water.

3.1.11 absorption: Process in which molecules of the refrigerant are dissolved into a liquid.

3.1.12 adsorption: Process in which molecules of the refrigerant are held at the surface of a solid (possibly porous) structure.

3.1.13 gas inlet connection: Part of the appliance intended to be connected to the gas supply.

3.1.14 mechanical joint (mechanical means of obtaining soundness): 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.

3.1.15 gas circuit: Part of the appliance that conveys or contains the gas between the appliance gas inlet connection and the burner(s).

3.1.16 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.

3.1.17 gas rate adjuster: 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.

3.1.18 setting an adjuster: Procedure by which an adjuster is immobilized in a position by some means such as a screw, etc.

3.1.19 sealing an adjuster: Procedure by which changing the setting of an adjuster breaks the sealing material and makes the interference with the adjuster apparent.

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 the fully opened position.

3.1.20 putting an adjuster or a control out of service: Procedure by which a control (temperature, pressure, etc.) is put out of action and sealed in this position. The appliance then functions as if this device had been removed.

3.1.21 injector: Component that admits the gas into a burner.

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

3.1.23 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.

3.1.24 ignition burner: Burner whose flame is intended to ignite another burner.

3.1.25 aeration adjuster: 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'.

3.1.26 Combustion products circuit

3.1.26.1 combustion chamber: Enclosure inside which combustion of the air-gas mixture takes place.

3.1.26.2 flue outlet: Part of a type B appliance that connects with a flue to evacuate the products of combustion.

3.1.26.3 draught diverter: Device placed in the combustion products circuit to reduce the influence of flue-pull and to prevent that of down-draught on the burner performance and combustion.

3.1.26.4 flue damper: 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.

3.1.26.5 flue terminal: Device fitted at the end of the duct system that enables the discharge of flue gases and may, at the same time, allow entry of combustion air.

3.2 Adjusting, control and safety devices

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

3.2.4 programme: 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: 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: Signal given by the flame detector device, normally when the flame sensor senses a flame.

3.2.7 flame simulation: Condition that occurs when the flame signal indicates the presence of a flame when in reality no flame is present.

3.2.8 pressure governor [2]**:** Device that 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: Governor provided with means for changing the outlet pressure setting.

3.2.10 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.

3.2.11 automatic shut-off valve: Device that automatically opens, closes or varies the gas rate on a signal from the control circuit and/or the safety circuit.

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[2] The term 'governor' is used in this case and for a volume governor.