SLOVENSKI STANDARD
SIST EN 13611:2002

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Varnostne in kontrolne naprave za plinske gorilnike in plinske aparate – Splošne zahteve

Safety and control devices for gas burners and gas-burning appliances - General requirements

Sicherheits-, Regel- und Steuereinrichtungen für Gasbrenner und Gasgeräte - Allgemeine Anforderungen

Equipements auxiliaires pour bruleurs à gaz et appareils à gaz -Exigences générales

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23.060.40	Tlačni regulatorji	Pressure regulators
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EUROPEAN STANDARD
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English version

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This European Standard was approved by CEN on 10 March 2000.

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

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Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 58 "Safety and control devices for gas-burners and gas-burning appliances", the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by February 2001, and conflicting national standards shall be withdrawn at the latest by February 2001.

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.

This European Standard covers type testing only.

This standard recognizes the safety level specified by CEN/TC 58 and is regarded as a horizontal standard dealing with the safety, construction and performance of controls for gas burners and gas-burning appliances and to their testing.

This European Standard is to be used in conjunction with the specific standard for a specific type of control, (e.g. EN 88, EN 125, EN 126, EN 161, EN 257, EN 298, EN 1854) or for controls for specific applications. This standard may also be applied, so far as reasonable, to controls not mentioned in a specific standard and to controls designed on new principles, in which case additional requirements may be necessary.

Other control standards should make use of this standard by adapting this standard and stating "addition", "modification" or "replacement" in their corresponding clauses.

1 Scope

This European Standard deals with the safety, construction and performance requirements of safety, control or regulating devices and sub-assemblies or fittings (hereafter referred to as controls) for burners and gas-burning appliances using fuel gases of the 1st, 2nd or 3rd families and to their testing.

This European Standard is to be used in conjunction with the specific control standard.

When no specific control standard exists, the control can be tested according to this standard and further tests taking into account the intended use.

Controls to which this European Standard applies include the following:

— Automatic shut-off valves;

— Burner controls

— Flame supervision devices;

— Gas/air ratio controls;

— Pressure Governors;

— Manual taps;

— Mechanical thermostats;

— Multifunctional controls;

— Pressure sensing devices;

— Valve proving systems;

— Zero governors

The methods of test given in this standard are intended for product type testing. Tests intended for production testing are not specifically included.

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 60730-1 : 1995, *Automatic electrical controls for household and similar use – Part 1: General requirements*

EN 61000-4-2 : 1995, *Electromagnetic compatibility (EMC) - Part 4: Testing and measuring techniques - Section 2: Electrostatic discharge immunity (IEC1000-4-2:1995)*

EN 61000-4-3 : 1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques - Section 3: Radiated radio-frequency, electromagnetic field immunity test(IEC 61000-4-3:1995, modified)*

EN 61000-4-4 : 1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques - Section 4: Electrical fast transient/burst immunity test (IEC 61000-4-4:1995)*

EN 61000-4-5 : 1995, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques - Section 5: Surge immunity test (IEC 61000-4-5:1995)*

EN 61000-4-6 : 1996, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques - Section 6: Immunity to conducted disturbances, induced by radio-frequency fields (IEC 61000-4-6:1996)*

EN 61000-4-11 : 1994, *Electromagnetic compatibility (EMC) – Part 4: Testing and measuring techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests (IEC 61000-4-11:1994)*

ISO 7-1 : 1994, *Pipe threads where pressure-tight joints are made on the threads – Part 1: Dimensions, tolerances and designation*

ISO 65 : 1981, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*

ISO 228-1 : 1994, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation*

ISO 262 : 1998, *ISO general purpose metric screw threads – Selected sizes for screws, bolts and nuts*

ISO 274 : 1975, *Copper tubes of circular section – Dimensions*

ISO 301 : 1981, *Zinc alloy ingots intended for casting*

ISO 1817 : 1999, *Rubber, vulcanized – Determination of the effect of liquids*

ISO 7005, *Metallic flanges*

3 Terms and definitions

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

3.1
control
device which directly or indirectly controls the gas flow and/or provides a safety function within a gas burner or gas-burning appliance.

3.2
closure member
movable part of the control which shuts off the gas flow.

3.3
breather hole
orifice which allows atmospheric pressure to be maintained within a compartment of variable volume.

3.4
external leak-tightness
leak-tightness of a gas-carrying compartment with respect to atmosphere.

3.5
internal leak-tightness
leak-tightness of the closure member (in the closed position) sealing a gas-carrying compartment with respect to another compartment or to the outlet of the control.

3.6
inlet pressure
pressure at the inlet of the control.

3.7
outlet pressure
pressure at the outlet of the control.

3.8
pressure difference
difference between the inlet and outlet pressures.

3.9
maximum inlet pressure
highest inlet pressure declared by the manufacturer at which the control may be operated.

3.10
minimum inlet pressure
lowest inlet pressure declared by the manufacturer at which the control may be operated.

3.11
flow rate
volume flowing through the control in unit time.

3.12
rated flow rate
air flow rate at a specified pressure difference declared by the manufacturer, corrected to standard conditions.

3.13
maximum ambient temperature
highest temperature of the surrounding air declared by the manufacturer at which the control may be operated.

3.14
minimum ambient temperature
lowest temperature of the surrounding air declared by the manufacturer at which the control may be operated.

3.15
mounting position
position declared by the manufacturer for mounting the control.

3.16
nominal size (DN)
numerical designation of size, for reference purposes, loosely related to manufacturing dimensions, common to all components in a piping system.

4 Classification

4.1 Classes of control

Where appropriate, controls are classified by application (e.g. sealing force, performance characteristics, number of operations during their working life). For classification of controls, see the specific control standard.

4.2 Groups of control

Controls are grouped according to the bending stresses which they are required to withstand (see table 4).

Group 1 controls

— Control*s* for use in an appliance or installation where they are not subjected to bending stresses imposed by installation pipework (e.g. by the use of rigid adjacent supports).

Group 2 controls

— Controls for use in any situation, either internal or external to the appliance, typically without support.

NOTE Controls which meet the requirements of a group 2 control also meet the requirements of a group 1 control.

5 Units of measurement and Test conditions

5.1 Dimensions

Dimensions are given in millimetres.

5.2 Pressures

Pressures are static pressures relative to atmospheric pressure and are given in millibars or bars[1)] .

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1) 1 mbar = 100 N/m^2 = 100 Pa

5.3 Bending moments and torques

Bending moments and torques are given in *Newton* metres.

5.4 Test conditions

Where no specific methods of test are given, conformity with these requirements shall be verified by inspection and/or measurement.

Tests are carried out with air at (20 ± 5) °C and at an ambient temperature of (20 ± 5) °C, unless otherwise specified.

All measured values are corrected to the standard conditions:

15 °C, 1013 mbar, dry.

Controls which can be converted to another gas family by exchanging components are additionally tested with the conversion components.

Tests are carried out in the mounting position declared by the manufacturer. Where there are several mounting positions, tests are carried out in the least favourable position.

Where possible those tests already covered by other standards (e.g. EN 60730-series) shall be combined.

NOTE The specific control standard will specify these tests.

6 Construction requirements

6.1 General

Controls shall be designed, manufactured, and assembled so that the various functions operate correctly when installed and used according to the manufacturer's instructions.

All pressurized parts of a control shall withstand the mechanical and thermal stresses to which it is subjected without any deformation affecting safety.

In general conformity with the requirements given in this standard is verified by the methods of test given in this standard or the specific control standard.

6.2 Construction

6.2.1 Appearance

Controls shall be free from sharp edges and corners which could cause damage, injury or incorrect operation. All parts shall be clean internally and externally.

6.2.2 Holes

Holes for screws, pins, etc., used for the assembly of parts of the control or for mounting, shall not penetrate gasways. The wall thickness between these holes and gasways shall be at least 1 mm.

Holes necessary during manufacture which connect gasways to atmosphere but which do not affect the operation of the control shall be permanently sealed by metallic means. Suitable jointing compounds may additionally be used.

6.2.3 Breather holes

Breather holes in controls with diaphragms, which are not provided with a connection for a vent pipe, shall be designed in such a way that when the diaphragm is damaged, no more than 70 dm3/h of air escapes at the maximum inlet pressure.

Conformity shall be verified by the method given in **6.2.4**.

For maximum inlet pressures below 30 mbar, this requirement is deemed to be met if the diameter of the breather hole does not exceed 0,7 mm.

If a leakage rate limiter is used, it shall be able to withstand three times the maximum inlet pressure. If a safety diaphragm is used as a leakage rate limiter, it shall not take the place of the working diaphragm in case of a fault.

Breather holes shall be protected against blockage or they shall be located such that they do not easily become blocked. They shall be positioned in such a way that the diaphragm cannot be damaged by a sharp device inserted through the breather hole.

6.2.4 Test for leakage of breather holes

Rupture the dynamic part of the working diaphragm. Ensure all closure members of the control, if any, are in the open position. Pressurize all gas-carrying compartments to the maximum inlet pressure and measure the leakage rate.

6.2.5 Screwed fastenings

Screwed fastenings which may be removed for servicing or adjustment shall have metric threads to ISO 262 : 1998 unless a different thread is essential for the correct operation or adjustment of the control.

Self-tapping screws which cut a thread and produce swarf shall not be used for connecting gas-carrying parts or parts which may be removed for servicing.

Self-tapping screws which form a thread and do not produce swarf may be used provided that they can be replaced by metric machine screws conforming to ISO 262 : 1998.

6.2.6 Jointing

Jointing compounds for permanent assemblies shall remain effective under normal operating conditions.

Soldering or other processes where the jointing material has a melting point below 450 °C after application shall not be used for connecting gas-carrying parts except for additional sealing.

6.2.7 Moving parts

The operation of moving parts (e.g. diaphragms, bellows) shall not be impaired by other parts. There shall be no exposed moving parts which could adversely affect the operation of controls.

6.2.8 Sealing caps

Sealing caps shall be capable of being removed and replaced with commonly available tools and sealed (e.g. by lacquer). A sealing cap shall not hinder adjustment within the whole range declared by the manufacturer.

6.2.9 Dismantling and reassembly

Parts which need to be dismantled for servicing or adjustment shall be capable of being dismantled and reassembled using commonly available tools. They shall be constructed or marked in such a way that incorrect assembly is impossible when following the manufacturer's instructions.

Closure parts, including those of measuring and test points, which may be dismantled for servicing or adjustment shall be constructed such that leak-tightness is achieved by mechanical means (e.g. metal-to-metal joints, O-rings) without using jointing compounds such as liquids, pastes or tapes.

Closure parts not intended to be dismantled shall be sealed by means which will show evidence of interference (e.g. lacquer).

6.3 Materials

6.3.1 General material requirements

The quality of materials, the dimensions used and the method of assembling the various parts shall be such that construction and performance characteristics are safe. Performance characteristics shall not alter significantly during a reasonable life when installed and used according to the manufacturer's instructions. Under these circumstances, all components shall withstand any mechanical, chemical, and thermal conditions to which they may be subjected during service.

6.3.2 Housing

Parts of the housing which directly or indirectly separate a gas-carrying compartment from atmosphere shall either:

— be made from metallic materials, or

— on removal or fracture of non-metallic parts other than O-rings, gaskets, seals and diaphragms, no more than 30 dm^3/h of air escapes at the maximum inlet pressure.

6.3.3 Test for leakage of housing after removal of non-metallic parts

Remove all non-metallic parts of the housing which separate a gas-carrying compartment from atmosphere, excluding O-rings, seals, gaskets and diaphragms. Pressurize the inlet and outlet(s) of the control to the maximum inlet pressure and measure the leakage rate.

6.3.4 Zinc alloys

Zinc alloys shall only be used for gas-carrying parts of controls up to DN 50 with maximum working pressures up to 200 mbar and of quality ZnAl4 to ISO 301 : 1981 where the parts do not exceed a temperature of 80 °C. Where the main inlet or outlet threaded connections are made of zinc alloys, threads shall be external and conform to ISO 228-1 : 1994.

6.3.5 Springs

6.3.5.1 Closure springs

Springs providing the sealing force for any closure member of the control shall be made of corrosion-resistant materials and shall be designed to be fatigue-resistant.

6.3.5.2 Springs providing closing force and sealing force

Closing force and sealing force shall be provided by spring action. Springs providing the closing and sealing force shall be designed for oscillating loads and for fatigue resistance.

Springs with wire diameter up to and including 2,5 mm shall be made from corrosion-resistant materials

Springs with wire diameter above 2,5 mm shall either be made from corrosion-resistant materials or shall be protected against corrosion.

6.3.6 Resistance to corrosion and surface protection

All parts in contact with gas or atmosphere and springs other than those covered by **6.3.5**, shall either be made from corrosion-resistant materials or shall be suitably protected. The corrosion protection for springs and other moving parts shall not be impaired by any movement.

6.3.7 Impregnation

Where impregnation is part of the manufacturing process, it shall be carried out using an appropriate procedure, (e.g. vacuum or internal pressure, using appropriate sealing materials).

6.3.8 Seals for glands for moving parts

Seals for moving parts which pass through the body to atmosphere and seals for closure members shall be made only of solid, mechanically stable material of a type which does not deform permanently. Sealing paste shall not be used.

Manually adjustable packing glands shall not be used for sealing moving parts.

NOTE An adjustable gland set by the manufacturer and protected against further adjustment is considered to be non-adjustable.

Bellows shall not be used as the sole sealing element against atmosphere.

6.4 Gas connections

6.4.1 Making connections

It shall be possible to make all gas connections using commonly available tools, e.g. by the provision of suitable spanner flats.

6.4.2 Connection sizes

Equivalent connection sizes are given in table 1.