



SLOVENSKI STANDARD
SIST EN 1854:1997
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Pressure sensing devices for gas burners and gas burning appliances

Druckwächter für Gasbrenner und Gasgeräte

Dispositifs de surveillance de pression pour bruleurs a gaz et appareils a gaz

Ta slovenski standard je istoveten z: **EN 1854:1997**

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ICS:

23.060.40	V æ } ã^*~ æ[!lä	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

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EUROPEAN STANDARD

EN 1854

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 1997

ICS 23.060.40; 27.060.20

Descriptors: gas appliances, burners, pressure, inspection devices, safety devices, definitions, classifications, equipment specifications, materials, performance evaluation, leaktightness, specifications, durability, tests, testing conditions

English version

Pressure sensing devices for gas burners and gas burning appliances

Dispositifs de surveillance de pression pour brûleurs à gaz et appareils à gaz Druckwächter für Gasbrenner und Gasgeräte

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This European Standard was approved by CEN on 1997-07-24. 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.

The European Standards exist 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.

CEN

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 1998, and conflicting national standards shall be withdrawn at the latest by February 1998.

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.

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1 Scope

This European Standard specifies requirements and test methods for pressure sensing devices (referred to as psds) for the control of combustible gases of the first, second and third families, air, combustion products and mixtures thereof for pressures up to 4 bar. It covers all types of psd including electronic, differential and inferential types.

The requirements for 'S' class psd are intended to meet the requirements for increased reliability for steam boilers.

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 298: 1993	Automatic gas burner control systems for gas burners and gas burning appliances with or without fans.
EN 549: 1994	Specification for rubber materials for seals and diaphragms for gas appliances and gas equipment
ENV 1954: 1996	Internal and external fault behaviour of safety related electronic parts of gas appliances
EN 60529: 1991	Classification of degrees of protection provided by enclosures (IP code)
EN 60730-1: 1995	Automatic electrical controls for household and similar use Part 1: General requirements
EN 60730-2-6: 1995	Automatic electrical controls for household and similar use Part 2: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements
EN 61058	Switches for appliances

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 75: 1993	Plastics - Determination of temperature of deflection under load
ISO 228-1: 1994	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation.
ISO 262: 1973	ISO general purpose metric screw threads - Selected sizes for screws, bolts and nuts
ISO 301: 1981	Zinc alloy ingots intended for casting
IEC 536: 1992	Classification of electrical and electronic equipment with regard to protection against electric shock
ISO 1817: 1985	Rubber, vulcanized - Determination of the effect of liquids
ISO 7005:	Metallic flanges

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3 Definitions

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

- 3.1 pressure sensing device (psd):** Device which senses pressure and provides a signal.
- 3.2 maximum working pressures (p_{max}):** The maximum pressure, positive or negative, the -psd can sustain without damage as declared by the manufacturer.
- 3.3 operating pressure:** The pressure at which the psd operates or switches.
- 3.4 highest set point:** The highest declared pressure to which the psd can be adjusted.
- 3.5 lowest set point:** The lowest declared pressure to which the psd can be adjusted.

3.6 operating pressure range (set point range): Range of adjustment of the psd between the highest and lowest set points.

3.7 upper operating pressure: The pressure at which the psd operates or switches during an increase in pressure.

3.8 lower operating pressure: The pressure at which the psd operates or switches during a decrease in pressure.

3.9 operating differential: The difference between the upper and lower operating pressures.

3.10 deviation: The difference between the declared or indicated operating pressure and the actual pressure measured before the endurance test expressed as a percentage of the declared or indicated operating pressure.

3.11 drift: The difference between the measured values of the operating pressure before and after the endurance test expressed as a percentage of the operating pressure before the endurance test.

3.12 standard conditions: The standard conditions for air and gas are 15 °C, 1013 mbar, dry.

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4 Classification

The psd shall be classified by the following classes. [SIST EN 1854:1997
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- a) sensed medium, e.g. air, combustible gas, combustion products;
- b) class of electrical protection to IEC 536: 1992 (Class I, II or III);
- c) software class to EN 60730-1: 1995 (A, B, C);
- d) IP class to EN 60529: 1991;
- e) vibration resistance if applicable (see 7.5.6);
- f) class 'S' if applicable (see 7.5.5).

5 Units

5.1 All dimensions are expressed in millimetres.

5.2 All pressures are static pressures relative to atmospheric pressure and are expressed in millibars or bars.¹⁾

5.3 Torques are expressed in Newton metres.

6 Construction requirements

6.1 General

6.1.1 The psd shall be designed, manufactured and assembled so that it functions correctly when installed and used according to the manufacturer's instructions.

6.1.2 The psd shall be free from sharp edges and corners which might cause damage, injury or incorrect operation.

6.1.3 The psd shall be designed such that access to internal parts requires the use of tools.

6.1.4 Parts that require dismantling (e.g. for servicing) shall be capable of being dismantled and reassembled with commonly available tools and shall be so constructed or marked that incorrect assembly is impossible following the manufacturer's instructions.

6.1.5 The function of moving parts (e.g. diaphragms, bellows) shall not be impaired by other parts.

6.1.6 Sealing caps of adjusters, if used, shall only be capable of removal and replacement with commonly available tools and shall be capable of being sealed e.g. by lacquer. A sealing cap shall not hinder adjustment within the whole range declared by the manufacturer.

6.1.7 Blockage of auxiliary canals and orifices shall not lead to an unsafe situation or these shall be protected against blockage by suitable means.

6.1.8 The internal diameter of apertures of all compartments used for pressure transmission shall not be less than 0,7 mm, except in cases where a smaller aperture is protected against fouling and clogging by suitable measures, e.g. filters which may be external (see 9.2).

¹⁾ 1 mbar = 100 N/m² = 100 Pa.

6.1.9 *Psds for combustible gas.*

6.1.9.1 Psds for combustible gas shall in addition conform with 6.1.9.2 to 6.1.9.6.

6.1.9.2 Holes for screws, pins, etc., which are used for the assembly of parts of the psd or for mounting, shall not penetrate gasways.

The wall thickness between these holes and gasways shall be at least 1 mm.

6.1.9.3 Holes necessary in manufacture which connect gasways to the atmosphere but which do not affect the function of the psd shall be permanently sealed by metallic means.

NOTE: Suitable jointing compounds may additionally be used.

6.1.9.4 Closure parts, including those of measuring and test points, which may be dismantled for servicing, adjustment or conversion, shall be constructed such that leak-tightness in accordance with 7.3 will be achieved by mechanical means (e.g. metal to metal joints, O-rings). This excludes all jointing compounds such as liquids, pastes and tapes. Leak-tightness shall also be maintained after dismantling and reassembling.

Jointing compounds, however, may be used for permanent assemblies and shall remain effective under normal operating conditions.

6.1.9.5 Screwed fastenings for combustible gas-carrying parts that may be removed during servicing shall have metric threads to ISO 262-1979.

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

6.1.9.7 Pressure test nipples, where fitted, shall have an external diameter of $(9_{-0,5}^0)$ mm and a useful length of at least 10 mm for connection to tubing. The equivalent diameter of the bore shall be not greater than 1 mm.

6.2 Materials

6.2.1 General

6.2.1.1 The quality of materials and the dimensions used and the methods of assembling the various parts shall be such that construction and performance characteristics are safe. Moreover, the 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.

6.2.1.2 Where plastics materials are used they shall have a declared heat deflection temperature of not less than 1,2 times the maximum declared ambient temperature when measured in accordance with ISO 75: 1993.

Conformity is checked by reference to manufacturer's data.

6.2.2 Zinc alloys

Zinc alloys shall only be used for gas-carrying parts if of quality ZnAl4 to ISO 301: 1981 and if the parts will not be exposed to a temperature higher than 80 °C. For the main inlet and outlet threaded connections, only external threads conforming to ISO 228-1: 1994 are permitted if these connections are made of zinc alloy.

6.2.3 Housing

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For combustible gas psds, gas-carrying compartments shall be constructed such that:

- a) either on removal or fracture of non-metallic parts, under all circumstances not more than 70 dm³/h of air can escape at the maximum working pressure when tested according to 8.3.2.2;
- b) or housings and diaphragms in psds for maximum working pressure up to 600 mbar may be constructed from non-metallic materials provided that both the following requirements are met:
 - following the test of the diaphragm against breakage according to 8.3.2.3, a leakage rate of 70 dm³/h is not exceeded when the psd is returned to room temperature;
 - the gas carrying compartment is protected from the gas supply by a metallicly housed metallic flow restrictor of less than 1 mm diameter.

6.2.4 Resistance to corrosion and surface protection

Any part in contact with the combustible gas or the surrounding atmosphere and springs shall be manufactured 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.

6.2.5 Impregnation

A production-line treatment such as impregnation carried out using an appropriate procedure, e.g. vacuum or internal pressure, using appropriate sealing materials is permissible.

6.2.6 Seals for glands for moving parts

Seals for moving parts which pass through the body to atmosphere shall only be made of solid material (e.g. synthetic materials with proper mechanical support and of proper mechanical stability) of a type which does not deform permanently (e.g. no sealing paste).

Manually adjustable packing glands shall not be used for sealing moving parts. An adjustable gland adjusted 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 the atmosphere.

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6.3 Mechanical connections

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6.3.1 Threads for psds for combustible gas

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6.3.1.1 It shall easily be possible to apply the necessary forces when making any gas connection e.g. by suitable spanner flats for commonly available tools.

6.3.1.2 When the inlet or outlet thread is a pipe thread it shall be to ISO 7-1: 1994 or to ISO 228-1: 1994 and shall be chosen from the series given in table 1.