



SLOVENSKI STANDARD
SIST EN 12078:1999
01-december-1999

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Zero governors for gas burners and gas burning appliances

Nulldruckregler für Gasbrenner und Gasgeräte

Détendeurs a zéro pour bruleurs a gaz et appareils a gaz

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Ta slovenski standard je istoveten z: EN 12078:1998

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ICS:

23.060.40

SIST EN 12078:1999

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EUROPEAN STANDARD

EN 12078

NORME EUROPÉENNE

EUROPÄISCHE NORM

August 1998

ICS 23.060.40

Descriptors: gas appliances burners, pressure regulators, definitions, safety, equipment specifications, materials, junctions, dimensions, performance evaluation, durability, tests, leak tests, performance tests, marking, technical notices

English version

Zero governors for gas burners and gas burning appliances

Détendeurs à zéro pour brûleurs à gaz et appareils à gaz

Nulldruckregler für Gasbrenner und Gasgeräte

This European Standard was approved by CEN on 26 July 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.

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

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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 1999, and conflicting national standards shall be withdrawn at the latest by February 1999.

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.

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1 Scope

This standard specifies the safety, constructional and performance requirements for zero pressure governors, hereafter referred to as zero governors, intended for use with gas appliances. It also gives the test procedures for evaluating these requirements and information necessary for the purchaser and user.

This standard applies to zero governors for gas-burning appliances that may be used and tested independently of these appliances. These zero governors are suitable for one or more of the fuel gases of the 1st, 2nd and 3rd families, at inlet pressures up to and including 200 mbar.

This standard does not cover:

- a) zero governors connected directly to distribution pipework or to a container that maintains a standard distribution pressure;
- b) zero governors intended for gas appliances to be installed out-of-doors and exposed to the environment.

This standard covers type testing only.

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.

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 68: 1973	ISO general purpose screw threads. Basic profile.
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 274: 1975	Copper tubes of circular section - Dimensions
ISO 301: 1981	Zinc alloy ingots intended for casting
ISO 1817: 1985	Rubber, vulcanized - Determination of the effect of liquids
ISO 7005	Metallic flanges
EN 60730-1: 1995	Automatic electrical controls for household and similar use Part 1: General requirements

3 Definitions

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

3.1 zero governor (atmospheric pressure regulator): Device which maintains the outlet pressure constant at a value equal to or close to atmospheric pressure independent of the variations in the inlet pressure and/or flow rate within defined limits.

3.2 Pressures

3.2.1 inlet pressure (p_1): Pressure at the inlet of the zero governor.

3.2.2 outlet pressure (p_2): Pressure at the outlet of the zero governor.

3.2.3 test pressure: Pressure to be applied during a test.

3.2.4 pressure drop: Pressure difference between the inlet and the outlet pressure with the zero governor valve open to its fullest extent.

3.2.5 maximum inlet pressure (p_{1max}): Highest inlet pressure declared by the manufacturer.

3.2.6 minimum inlet pressure (p_{1min}): Lowest inlet pressure declared by the manufacturer.

3.2.7 inlet pressure range: Range of inlet pressures between the maximum and minimum values.

3.2.8 setting point: This refers to the inlet and outlet pressures declared by the manufacturer, at which the zero governor is initially adjusted for test purposes (see 6.5.1 and 7.6.3) at a declared flow rate. The respective pressures and flow rate are termed "inlet setting pressure", "outlet setting pressure" and "setting flow rate".

3.3 flow rates

3.3.1 maximum flow rate (q_{max}): Maximum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m³/h of air at standard conditions. For a non-adjustable zero governor there is only one maximum flow rate.

3.3.2 minimum flow rate (q_{min}): Minimum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m³/h of air at standard conditions. For a non-adjustable zero governor there is only one minimum flow rate.

3.3.3 flow rate range: Range of flow rates between the maximum and minimum values.

3.3.4 setting flow rate: See 3.2.8.

3.4 component parts

3.4.1 breather hole: Orifice that allows atmospheric pressure to be maintained in a compartment of variable volume.

3.4.2 diaphragm: Flexible member which, under the influence of the forces arising from loading and pressure, operates the zero governor valve.

3.5 performance terms

3.5.1 external leak-tightness (soundness): Leak-tightness of a gas-carrying compartment with respect to atmosphere.

3.5.2 lock-up pressure: Outlet pressure at which a zero governor closes when the outlet of the governor is sealed. The increase in outlet pressure is expressed in mbar.

3.5.3 maximum ambient temperature: Highest temperature of the surrounding air, declared by the manufacturer at which the zero governor may be operated.

3.5.4 minimum ambient temperature: Lowest temperature of the surrounding air, declared by the manufacturer at which the zero governor may be operated.

3.5.5 mounting position: Position declared by the manufacturer for mounting the zero governor.

3.6 response time: The maximum time take for the output to reach stable conditions in response to a change in inlet pressure.

3.7 classification (see table 3)

3.7.1 group 1: A zero governor for use in an appliance and/or installation where it is not subjected to bending stresses imposed by installation pipework, e.g. by the use of rigid adjacent supports.

3.7.2 group 2: A zero governor for use in any situation, either internal or external to the appliance, typically without supports .

NOTE: A zero governor which meets the requirements of group 2 also meets the requirements for group 1.

4 Units of measurement

4.1 All dimensions are given in millimetres.

4.2 All pressures are static pressures relative to atmospheric pressure and are expressed in millibars¹⁾.

4.3 Bending moment and torques are given in newton metres.

5 Construction requirements

5.1 General

5.1.1 Zero governors shall be designed, manufactured and assembled so that they function correctly when installed and used according to the manufacturer's instructions.

5.1.2 All parts of a zero governor shall be free from sharp edges and corners which might cause damage, injury or incorrect operation.

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

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

¹⁾ 1 mbar = 100 N/m² = 100 Pa.

5.1.5 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 is achieved by mechanical means (e.g. metal to metal joints, O-rings). This excludes all jointing compounds such as liquids, pastes and tapes.

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

Closure parts not intended to be dismantled during servicing, adjustment or conversion shall be sealed by means which will show evidence of interference (e.g. lacquer).

5.1.6 Parts that require dismantling, e.g. for servicing, shall be capable of being dismantled and reassembled using commonly available tools and shall be constructed or marked such that, incorrect assembly is impossible when following the manufacturer's instructions.

5.1.7 Screwed fastenings that may be removed during servicing shall have metric threads to ISO 68: 1973 or ISO 262: 1973.

Self-tapping screws that cut a thread and produce swarf shall not be used for connecting gas-carrying parts or parts that may be removed for servicing. Self-tapping screws that form a thread and do not produce swarf may be used provided they can be replaced by metric machine screws conforming to the above ISO standards.

5.1.8 The operation of moving parts (e.g. for diaphragms, bellows) shall not be impaired by other parts.

5.1.9 Breather holes shall be designed so that, when the diaphragm is damaged, either:

- a) when tested in accordance with 7.3.3, the flow of air through the hole shall not exceed 70 dm³/h at the maximum inlet pressure, or
- b) they shall have a connection for a suitable vent pipe, in which case the installation and operating instructions shall state that the breather should be vented to a safe place.

For maximum inlet pressures up to 30 mbar, requirement a) above shall be deemed to be met with a breather hole of diameter not greater than 0,7 mm.

If compliance with a) is by the use of a leakage rate limiter, 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 the event of a fault.

Breather holes shall be protected against blockage or shall be located so that they do not easily become blocked. They shall be arranged such that the diaphragm cannot be damaged by any instrument inserted through the breather hole

5.1.10 Sealing caps, if used, shall 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.

5.1.11 The outlet pressure adjustment shall be readily accessible to authorized persons. Adjustment by unauthorized persons shall be discouraged by provisions for sealing or the need for special tools.

5.2 Materials

5.2.1 General material requirements

The quality and dimensions of materials used and the method of assembling the various parts shall be such that the construction and performance characteristics are safe and the performance characteristics do not alter

significantly during a reasonable life when the zero governor is installed, used and serviced in accordance with the manufacturer's instructions.

5.2.2 Solder

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

5.2.3 Zinc alloys

Zinc alloys shall only be used for gas-carrying parts if of quality ZnA14 to ISO 301: 1981 and if the parts will not be exposed to a temperature higher than 80 °C. For 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.

5.2.4 Housing

Parts of the housing that directly or indirectly separate a gas-carrying part from atmosphere shall be such that, on fracture of non-metallic parts other than O rings, seals, gaskets and diaphragms, no more than 30 dm³/h of air escapes when tested in accordance with 7.3.2.

5.2.5 Resistance to corrosion and surface protection

All springs and any part in contact with gas or the surrounding atmosphere, 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.

5.2.6 Impregnation

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

5.3 Connections

5.3.1 General

Equivalent connection sizes are given in table 1.

Table 1: Connection sizes

Nominal size DN	Designation of thread to ISO 7-1: 1994 or ISO 228-1: 1994	Nominal size of flanges to ISO 7005	Outside diameter of tubes for compression fittings (range in mm)
6	1/8	6	2 ≤ 5
8	1/4	8	6 ≤ 8
10	3/8	10	10 ≤ 12
15	1/2	15	14 ≤ 16
20	3/4	20	18 ≤ 22
25	1	25	25 ≤ 28
32	1 1/4	32	30 ≤ 32
40	1 1/2	40	35 ≤ 40
50	2	50	42 ≤ 50
65	2 1/2	65	-
80	3	80	-
100	-	100	-
125	-	125	-
150	-	150	-