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Pressure governors for gas appliances for inlet pressures up to 200 mbar

Druckregler für Gasgeräte für Eingangsdrücken bis zu 200 mbar

Régulateurs de pression pour appareils d'utilisation des combustibles gazeux pour pressions amont inférieures ou égales à 200 mbar

Ta slovenski standard je istoveten z: EN 88:1991

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ICS:

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English version

Pressure governors for gas appliances for inlet pressures up to 200 mbar

Régulateurs de pression pour appareils d'utilisation des combustibles gazeux pour pressions amont inférieures ou égales à 200 mbar Druckregler für Gasgeräte für Eingangsrücken bis zu 200 mbar

This European Standard was approved by CEN on 1991-06-05
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FOREWORD

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

NOTE : (referring to 2.2.2 in this Standard resulting from the discussions during the elaboration of the Standard within CEN/TC 58):

It should be noted that in some member countries there may be legislation limiting the application of zinc and zinc alloys.

In accordance with the Common CEN/CENELEC Rules, the following countries are bound to implement this European Standard :
Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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1. GENERAL

1.1 Object and field of application

This standard specifies the safety, constructional and performance requirements for pressure governors, hereafter referred to as 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 pressure governors for gas-burning appliances of nominal connection size up to and including DN 50 and that may be used and tested independently of these appliances. These governors are suitable for one or more of the fuel gases of the 1st, 2nd and 3rd families (see annex A), at inlet pressure up to and including 200 mbar.

This standard does not cover:

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

1.2 References

- ISO 7-1 : 1982 Pipe threads where pressure-tight joints are made on the threads
Part 1. Designation, dimensions and tolerances
- ISO 65 : 1981 Carbon steel tubes suitable for screwing in accordance with ISO 7/1
- ISO 228-1 : 1982 Pipe threads where pressure-tight joints are not made on the threads
Part 1. Designation, dimensions and tolerances
- 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 coating
- ISO 1817 : 1985 Rubber, vulcanized - Determination of the effect of liquids
- ISO 7005 : 1988 Metallic flanges SIST EN 88:1997
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ISO 6708 : 1980 Pipe components - Definition of nominal size

IEC 730-1 (1986) Automatic electrical controls for household and similar use
Part 1: General requirements

1.3 Definitions

1.3.1 governors

1.3.1.1 governor (pressure regulator): Device which maintains the outlet pressure constant independent of the variations in inlet pressure and/or flow rate within defined limits. (See annex B).

1.3.1.2 adjustable governor: Governor provided with means for changing the outlet pressure setting.

1.3.2 pressures

1.3.2.1 general

1.3.2.1.1 inlet pressure: Pressure at the inlet of the governor.

1.3.2.1.2 outlet pressure: Pressure at the outlet of the governor.

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

1.3.2.1.4 pressure difference: Difference between the inlet and outlet pressures.

1.3.2.1.5 pressure drop: Pressure difference with valve open to its fullest extent.

1.3.2.2 governor pressures

1.3.2.2.1 maximum inlet pressure ($P_{1max.}$): Maximum inlet pressure declared by the manufacturer.

1.3.2.2.2 minimum inlet pressure ($P_{1min.}$): Minimum inlet pressure declared by the manufacturer.

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

1.3.2.2.4 maximum outlet pressure ($P_{2max.}$): Maximum outlet pressure declared by the manufacturer.

1.3.2.2.5 minimum outlet pressure ($P_{2min.}$): Minimum outlet pressure declared by the manufacturer.

1.3.2.2.6 outlet pressure range: Range of outlet pressure between the maximum and minimum values.

1.3.2.2.7 setting point: This refers to the inlet and outlet pressures declared by the manufacturer, at which the governor is initially adjusted for test purposes (see 3.6 and 4.6.3) at a declared flow rate. The respective pressures and flow rate are termed 'inlet setting pressure', 'outlet setting pressure' and 'setting flow rate'.

1.3.2.2.8 inlet setting pressure: See 1.3.2.2.7.

1.3.2.2.9 outlet setting pressure: See 1.3.2.2.7.

1.3.3 governor flow rates

1.3.3.1 flow rate: Volume flowing through the governor in unit time.

NOTE: The nominal connection size of a governor does not necessarily determine its flow rate range.

1.3.3.2 maximum flow rate (q_{\max}): Maximum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m^3/h of air at standard conditions. For a non-adjustable governor there is only one maximum flow rate.

1.3.3.3 minimum flow rate (q_{\min}): Minimum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m^3/h of air at standard conditions. For a non-adjustable governor there is only one minimum flow rate.

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

1.3.3.5 setting flow rate: See 1.3.2.2.7.

1.3.4 component parts

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

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

1.3.4.3 diaphragm plate: Stiffening plate fitted to the diaphragm.

1.3.4.4 valve: Device which varies the gas flow directly.

1.3.5 performance

1.3.5.1 external leak tightness: Leak tightness of a gas-carrying compartment with respect to the atmosphere.

1.3.5.2 lock-up pressure: Outlet pressure at which a governor closes when the outlet of the governor is sealed. The increase in outlet pressure is expressed either in mbar or as a percentage.

1.3.5.3 to put out of action: To annul the operation of a governor and to seal the governor in that position.

1.3.6 miscellaneous

1.3.6.1 nominal size (DN): Numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions¹⁾.

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

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

1.3.6.4 mounting position: Position declared by the manufacturer for mounting the governor.

1.4 Classification

1.4.1 Classes of governor

A governor is classified as class A, class B or class C according to: the appropriate inlet pressure and flow rate limits given in table 5.

1.4.2 Groups of governor

A governor is classified as group 1 or group 2 according to the bending stresses that it is required to withstand (see table 3).

Group 1 governors

Governors intended 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.

Group 2 governors

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

NOTE: A governor that complies with the requirements for group 2 complies also with the requirements for group 1 governors.

1.4.3 Designation

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A governor is designated by class and group, for example as 'A2' for a governor of class A, group 2.

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1) This definition is taken from ISO 6708 - 1980.

1.5 Measuring units

1.5.1 All dimensions are given in millimetres.

1.5.2 All pressures are static pressures above the atmospheric pressure and are expressed in millibars.

1.5.3 Bending movement and torques are given in newton metres.

2. CONSTRUCTION REQUIREMENTS

2.1 General

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

2.1.2 Governors shall be free from sharp edges and corners which might cause damage, injury or incorrect operation.

The parts shall be clean internally and externally.

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

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

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

2.1.5 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 3.3 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.

Jointing compounds, however, 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).

2.1.6 Parts that require dismantling, e.g. for servicing, shall be capable of being dismantled and reassembled with common commercial tools and shall be so constructed or marked that following the instructions of the manufacturer, incorrect assembly is impossible.

Screwed fastenings that may be removed during servicing shall have metric threads to 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 in servicing.

Only self-tapping screws that form a thread and do not produce swarf may be used. They shall permit replacement by metric machine screws conforming to the above mentioned ISO standard.

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

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

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

- a) 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 operation instructions shall state that the breather shall 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) above 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 case 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 so arranged that the diaphragm cannot be damaged by a sharp cleaning device inserted through the breather hole.

2.1.10 Sealing caps, if used, shall be capable of removal and replacement with standard 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.

2.1.11 The outlet pressure adjustment shall be readily accessible to authorized persons but there shall be provision for sealing after adjustment. Means shall be provided to discourage interference by unauthorized persons. Appropriate means shall be provided to put the governor out of action.

2.2 Materials

2.2.1 General material requirements

The quality of materials and the dimensions used and the method 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 the governor is 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.

2.2.2 Zinc alloys

Zinc alloys shall only be used if of quality ZnAl₄ 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 of governors, only external threads conforming to ISO 228/1 - 1982 are permitted if these connections are made of zinc alloy.

2.2.3 Housing

Parts of the housing separating a gas-carrying compartment from the atmosphere shall be manufactured only of metallic materials.

This also applies to parts of the housing that are separated by a diaphragm from the gas-carrying compartment.

Nevertheless, a gas-carrying part may be made of non-metallic material provided that upon removal or fracture of this non-metallic part under all circumstances no more than 30 dm³/h of air can escape at the maximum inlet pressure.

This clause is not intended to cover diaphragms, 'O'-rings, gaskets and seals.

2.2.4 Resistance to corrosion

Any part in contact with the gas or the surrounding atmosphere, and also 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.

2.2.5 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.

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