

Specification for

**Gas appliance
governors of DN
greater than 50 and
for inlet pressures up
to 200 mbar**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee GSE/22, Safety and control devices for gas governors and gas burning appliances, upon which the following bodies were represented:

- Association of Control Manufacturers [TACMA (BEAMA Ltd.)]
- British Combustion Equipment Manufacturers' Association
- British Gas plc
- Department of Trade and Industry (Consumer Safety Unit, C A Division)
- Electricity Association
- L P Gas Association
- Society of British Gas Industries

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Foreword

This British Standard has been prepared by Technical Committee GSE/22.

It has been based on the requirements of BS EN 88 and covers appliance governors that are not included within the scope of BS EN 88 or prEN 334.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 16, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British 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 use with gas burners and gas burning appliances of nominal connection size greater than 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 at inlet pressure up to and including 200 mbar¹⁾.

This standard does not cover:

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

2 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

3 Definitions

For the purposes of this British Standard, the following definitions apply.

3.1

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 A)

3.2 Pressures

3.2.1 General

3.2.1.1

inlet pressure

the pressure at the inlet to the governor

3.2.1.2

outlet pressure

the pressure at the outlet of the governor

3.2.1.3

test pressure

the pressure to be applied during a test

3.2.1.4

pressure drop (fully open)

the difference between the inlet and outlet pressures with the valve open to its fullest extent

3.2.2 Governor pressures

3.2.2.1

maximum inlet pressure (P_1 max)

the maximum inlet pressure declared by the manufacturer

3.2.2.2

minimum inlet pressure (P_1 min)

the minimum inlet pressure declared by the manufacturer

3.2.2.3

inlet pressure range

the range of inlet pressure between the maximum and minimum values

3.2.2.4

maximum outlet pressure (P_2 max)

the maximum outlet pressure declared by the manufacturer

3.2.2.5

minimum outlet pressure (P_2 min)

the minimum outlet pressure declared by the manufacturer

3.2.2.6

setting point

the set of values for the inlet and outlet pressures, declared by the manufacturer, at which the governor is initially adjusted for test purposes (see 8.6.3) at a declared flow rate

NOTE The respective pressures and flow rate are termed “inlet setting pressure ($P_{1\text{ nominal}}$)”, “outlet setting pressure ($P_{2\text{ nominal}}$)” and “setting flow rate”.

¹⁾ 1 bar = 10^5 N/m² = 100 kPa

3.3 Governor flow rates

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.

3.3.2 maximum flow rate ($q_{\max}$)

a maximum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m^3/hour of air at reference conditions

NOTE For a non-adjustable governor there is only one maximum flow rate.

3.3.3 minimum flow rate ($q_{\min}$)

a minimum rate, as a function of inlet and outlet pressures, declared by the manufacturer and expressed in m^3/hour of air at reference conditions

NOTE For a non-adjustable governor there is only one minimum flow rate.

3.3.4 flow rate range

range of flow rate between the maximum and minimum values

3.3.5 setting flow rate

the flow rate, declared by the manufacturer, at which the governor is set for test purposes at declared inlet and outlet pressures (P_1 nominal and P_2 nominal respectively)

3.4 Component parts

3.4.1 breather hole

an orifice that allows atmospheric pressure to be maintained in a compartment of variable volume

3.4.2 diaphragm

a flexible member that, under the influence of the forces arising from loading and pressures, operates the valve

3.5 Operational terms

3.5.1 external leak tightness (soundness)

the leak tightness of a gas-carrying compartment with respect to the atmosphere

3.5.2 lock-up pressure

outlet pressure at which a governor closes when the outlet of the governor is sealed

NOTE The increase in outlet pressure is expressed either in mbar or as a percentage.

3.5.3 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 dimensions

3.5.4 maximum ambient temperature

the highest temperature of the surrounding air, declared by the manufacturer, at which the device may be operated

3.5.5 minimum ambient temperature

the lowest temperature of the surrounding air, declared by the manufacturer, at which the device may be operated

3.5.6 mounting position

a position declared by the manufacturer for mounting the device

4 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 7.4 for reference).

Group 1 governor

A governor 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 governor

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

NOTE A governor that conforms to the requirements for group 2 also conforms to the requirements for group 1 governors.

5 Measuring units

5.1 Pressures

All pressures are expressed as static pressures above the atmospheric pressure and are measured in millibar.

5.2 Standard reference conditions

These are the conditions to which all measured values are corrected. The standard reference conditions are 15 °C, 1 013 mbar absolute, dry.

6 Construction

6.1 General

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

6.1.2 Holes for screws, pins and other fasteners, which are used for the assembly of parts of the governor and for mounting, shall not penetrate gas ways. The wall thickness between these holes and gas ways shall be at least 1 mm.

6.1.3 Holes necessary in manufacture which connect gas ways to the atmosphere but which do not affect the function of the governor shall be permanently sealed by metallic means.

NOTE Suitable jointing compounds may be used additionally.

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

If jointing compounds are used for permanent assemblies they shall maintain leak-tightness under normal operating conditions.

Closure parts that are not to be dismantled during servicing or adjustment shall be sealed by means which will show evidence of interference.

NOTE Lacquer is an example of a sealing material suitable for this purpose.

6.1.5 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, correct assembly is readily achieved.

Screwed fastenings that may be removed during servicing shall have metric threads conforming to BS 3643.

If self-tapping screws are used for connecting gas-carrying parts, or parts that may be removed for servicing, only self-tapping screws that form a thread and do not produce swarf shall be used. They shall permit replacement by metric machine screws conforming to BS 3643.

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

6.1.7 Breather holes shall be so designed that, when the diaphragm is damaged, either a) or b) applies as follows.

- a) The flow of air through the hole shall not exceed 70 dm³/h at the maximum inlet pressure when tested in accordance with 8.3.3.

- b) They shall have a connection for a suitable vent pipe, in which case the installation and operating instructions shall state that the breather shall be vented to a safe place.

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 where blockage cannot readily occur. They shall be so arranged that the diaphragm cannot be damaged by any cleaning instrument inserted through the breather hole.

6.1.8 Sealing caps, if used, shall be capable of removal and replacement with standard tools and shall be capable of being sealed. A sealing cap shall not hinder adjustment within the whole range declared by the manufacturer.

NOTE Lacquer is an example of a sealing material suitable for this purpose.

6.1.9 The outlet pressure adjustment shall be readily accessible to authorized persons but there shall be provision for sealing after adjustment.

6.1.10 Appropriate means shall be provided to put the governor out of action, if this is declared by the manufacturer to be possible.

6.2 Materials and production processes

6.2.1 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 do not alter significantly during a reasonable life under normal conditions of installation and use. If the requirements of 8.5 and 8.8 are met, this requirement shall be deemed to have been satisfied.

6.2.2 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.

6.2.3 Zinc alloys

Zinc alloys shall only be used for gas-carrying parts if they conform to quality ZnAl₄ in accordance with 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 BS 2779:1986 shall be used if these connections are made of zinc alloy.

6.2.4 Housing

Parts of the housing that separate a gas-carrying compartment from the atmosphere shall be manufactured in one of the following ways:

- a) of metallic materials only;