

Automatic gas burners —

Part 2: Specification for packaged burners with input rating 7.5 kW up to but excluding 60 kW

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The preparation of this British Standard was entrusted by the Gas Standards Committee (GSE/-) to Technical Committee GSE/27, upon which the following bodies were represented:

- British Coal
- British Combustion Equipment Manufacturers' Association
- British Gas plc
- Chief and Assistant Chief Fire Officers' Association
- Department of the Environment (Property Services Agency)
- Electricity Supply Industry in England and Wales
- Fire Offices Committee
- Health and Safety Executive
- Society of British Gas Industries
- Water Tube Boilermakers' Association

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Verification	3
4 Gas flow pipework and controls	3
4.1 Strainers	3
4.2 Pipework and flow components	3
4.3 Gas supply	4
4.4 Safety shut-off systems	5
5 Combustion air, pre-purge and post-purge	5
5.1 Combustion air	5
5.2 Pre-purge and post-purge	6
6 Electrical supply and ancillary equipment	7
6.1 Electricity supply	7
6.2 Electrical equipment	7
7 Flame safeguards	8
7.1 Flame detection	8
7.2 Start-gas flame establishment	8
7.3 Main flame establishment	8
7.4 Flame failure in the running condition	9
8 Control system requirements	9
9 Fuel/air ratio control	10
10 Manufacturer's literature	10
11 Marking	10
12 Commissioning instructions	11
Table 1 — Test gases	3
Table 2 — Wall thickness of pipes complying with BS 3601	3
Table 3 — Flame safeguard drop-out times	9
Publications referred to	12

Foreword

This Part of BS 5885 has been prepared under the direction of the Gas Standards Committee and applies to single gas-fired automatic burners with input ratings of 7.5 kW up to but excluding 60 kW. It is therefore complementary to BS 5885-1 which covers burners with input rating 60 kW and above. Some of this Part of BS 5885 may be applicable to dual fuel burners.

In general, each requirement in this Part is accompanied by an appropriate means of verification, such means being by inspection, by measurement or by specified test.

In those cases where verification is to be achieved by measurement, no test method is given since the method of measurement is considered to be self-evident.

Verification of compliance with requirements which invoke other British Standards is to be demonstrated by means of a declaration from the burner manufacturer and, where third party certification is required, may necessitate the production of documentary proof.

Certain requirements are only capable of being verified when the burner is installed in its associated appliance. In these cases no verification procedure is specified as it is anticipated that the relevant appliance standard will incorporate the appropriate method of verification. For special plant, commissioning procedures will also need to take this into account. Requirements which also relate to burners employing induced draft fans can only be tested in situ.

It is recognized that for specialized heating processes it is permissible to use designs and test methods which differ from those specifically defined in this Part of BS 5885 but which nevertheless comply with the intent of the standard.

Similarly, new systems or procedures resulting from advances in technology may be applied to give equal or improved safety. It is not intended that this Part of BS 5885 should prohibit the development or use of such systems, but any departure from the specific requirements of the standard should be made only on the basis of sound engineering judgement and experience.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

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 12, 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 Part of BS 5885 specifies minimum requirements for automatic forced and induced draught packaged gas burners with heat input ratings of 7.5 kW up to but excluding 60 kW and capable of operating with 1st, 2nd or 3rd family gases at pressures not exceeding 35 mbar¹⁾ at the inlet to the control train supplied with the burner.

BS 5885 applies to burners intended for use in industrial processes. It does not cover burners intended for use in heating appliances, e.g. boilers, which are covered by BS EN 676, *Automatic forced draught burners for gaseous fuels*.

It covers single burners, and dual fuel burners when operating only on gas. It does not cover multi-burners.

It relates primarily to the safety aspects of automatic control and operation. It does not provide a complete specification for automatic burners and their ancillary equipment.

NOTE 1 The use of gases which are dirty, wet, of variable composition or high dewpoint may cause difficulties which are not covered in detail by this Part of BS 5885. In such cases, suppliers and users of equipment will need to take additional measures to comply with the requirements of this standard.

NOTE 2 The titles of the publications referred to in this standard are listed on pages 12 and 13.

2 Definitions

For the purposes of this Part of BS 5885 the definitions given in BS 1179-6 apply together with the following.

2.1 automatic burner

a burner in which, on starting from the completely shut-down condition, the start-gas flame is established and the main gas valves are actuated by the control without manual intervention

2.2 automatic packaged burner

a forced draught automatic gas burner that is built as a complete and independent unit incorporating air fan and control system

2.3 automatic restart

the automatic repetition of the starting-up sequence without manual intervention

2.4 flame detector

that part of the flame safeguard which is responsive to flame properties and signals the presence of flame

2.5 flame failure

the loss of the flame from the normally detected position by any cause other than the action of de-energizing the safety shut-off valves

2.6 flame safeguard

a control responsive to flame properties detecting the presence of a nominated flame and, in the event of ignition failure or subsequent flame failure, causing safety shut-down or lock-out

2.7 flame simulation

a condition where the flame detector erroneously signals the presence of flame

2.8 forced draught burner

a burner in which the combustion air is provided under pressure, usually from a fan

2.9 hazardous condition

an abnormal condition involving risk to persons or property

2.10 high/low burner

a burner in which, under the operation of the process control, the firing rate is either full on or at low fire

2.11 induced draught burner

a burner into which the combustion air is introduced by providing a suction in the combustion chamber by mechanical means, usually a fan

2.12 lock-out

a safety shut-down condition of a control system such that restart cannot be accomplished without manual intervention

2.13 main flame

a flame, other than the start-gas flame, on the main burner

2.14 main flame establishment period

a period during which the main gas safety shut-off valve(s) is permitted to be open before the pilot flame is extinguished and before the flame safeguard is required to supervise the main flame alone

¹⁾ 1 mbar = 100 N/m² = 100 Pa.

2.15**main gas supply**

gas that is supplied to establish and maintain the main flame

2.16**modulating burner**

a burner in which, under the operation of the process control, the firing rate is variable between the full on and low fire rates

2.17**operational specification**

a full description of the control system together with an explanation of the operation of the control system during each stage of the operating sequence. It also includes an explanation of the system behaviour in the event that any signals from any external devices are incorrect (by failure to ignite, flame failure, air flow failure etc.)

2.18**pilot flame**

a flame, established at a separate pilot burner, that is used to ignite the main flame

2.19**post-purge**

a purge that follows shut-down

2.20**pre-purge**

a purge that precedes any ignition attempt

2.21**purge**

the introduction of air into the combustion chamber and flue passages so as to displace any remaining fuel/air mixture

2.22**safety shut-down**

the action of shutting off gas and ignition energy by means of a safety control such that restart takes place only after manual intervention or automatic recycling

NOTE Safety shut-down may include triggering an alarm.

2.23**safety shut-off system**

a system of safety shut-off valves with associated control circuits that enables the supply of gas to the burner to be admitted or shut-off

2.24**safety shut-off valve**

a valve designed to open when energized and close automatically when de-energized, activated by the safety controls of a burner system

2.25**self-checking flame safeguard system**

a flame safeguard system having a device which automatically checks the functioning of the flame safeguard periodically

2.26**start-gas flame**

a flame established at the start-gas rate either at the main burner or at a separate pilot burner

2.27**start-gas flame establishment**

the establishment of a proved and supervised start-gas flame

2.28**start-gas flame ignition period**

the period during which the start-gas safety shut-off valve is permitted to be open before the flame safeguard is required to supervise the start-gas flame

2.29**start-gas flame proving period**

the period during which the start-gas flame is supervised by a flame safeguard system following the cessation of the ignition period and before the opening of the main gas safety shut-off valve(s)

2.30**start-gas rate**

the restricted gas flow rate admitted either to a separate pilot burner or to the main burner during the start-gas flame establishment period

2.31**start-gas supply**

gas that is supplied at the start-gas rate to establish the start-gas flame

2.32**stoichiometric gas rate**

the gas rate at which, if reacted completely with the combustion air flow, the gas would just consume all the oxygen in the air

2.33**type test**

a test carried out as part of a programme to approve to a particular specification a device which is representative of production

2.34**vent valve**

a normally open valve fitted between two safety shut-off valves