

Installation and maintenance of gas-fired ducted air heaters of rated input not exceeding 70 kW net (2nd and 3rd family gases) — Specification

ICS 97.100.20

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee GSE/30, Gas installations (1st, 2nd and 3rd family gases), upon which the following bodies were represented:

Boiler and Radiator Manufacturer's Association Ltd.
British Flue and Chimney Manufacturers Association
BSI Consumer Policy Committee
Catering Equipment Suppliers' Association
Centrica plc
CORGI
Department of Trade and Industry
Health and Safety Executive
Heating and Ventilating Contractors' Association
ICOM Energy Association
Institute of Domestic Heating and Environmental Engineers
Institution of Gas Engineers and Managers
LP Gas Association
Society of British Gas Industries
Co-opted Members

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Foreword

This British Standard has been prepared by Technical Committee GSE/30. It supersedes BS 5864:1989, which is withdrawn.

In this revision, the layout has been modified to follow the systematic approach adopted in other gas installation standards. The revision provides an update of the previous version and has been extended to reflect changes in installation practice and legislation.

Manufacturers' instructions might specify a method of installation, testing and commissioning or maintenance that differs in points of detail from this standard. Manufacturers' instructions take precedence over this standard. This standard is applicable where manufacturer's instructions do not give specific advice.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

In particular, attention is drawn to the following statutory regulations:

- The Gas Safety (Installation and Use) Regulations 1998 [1]
- The Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004 [2]
- The Gas Appliance (Safety) Regulations 1995 [3]
- The Asbestos (Prohibitions) Regulations 1992 [4]
- The Building Regulations 2000, as amended [5]
- The Building Standards (Scotland) Regulations 1990, as amended [6]
- The Building Regulations (Northern Ireland) 2000 [7]
- The Gas Safety (Application) (Isle of Man) Order 1996 [8]
- The Water Supply (Water Fittings) Regulations 1999, as amended [9]

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 20, an inside back cover and a back cover.

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1 Scope

This British Standard specifies the selection, installation and maintenance (see Note 1) of flued, gas-fired, ducted-air heaters of rated input not exceeding 70 kW, based on net calorific value, burning 2nd or 3rd family gases to heat one or more rooms or internal spaces in either domestic premises (see Note 2) or commercial premises.

It is applicable to warm air heaters that incorporate a fan to circulate the warm air.

It is also applicable to combined air heater/circulator installations and to the servicing and maintenance of heaters that distribute warm air by natural convection (see Annex A).

NOTE 1 For the purposes of this standard, installation includes design, inspection and commissioning. It is recognised that each of these tasks can be performed by the same person.

NOTE 2 As well as normally constructed dwellings, domestic premises include any permanently sited leisure accommodation vehicles, residential park homes and permanently moored boats. Particular and additional requirements exist for these categories of premises and can be found in IGE/UP/8 [10]. Neither this standard nor IGE/UP/8 [10] applies to gas installations in towed or motorised caravans.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 5440-1, *Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) — Part 1: Specification for installation and maintenance of flues*.

BS 5440-2, *Installation and maintenance of flues and ventilation for gas appliances of rated input not exceeding 70 kW net (1st, 2nd and 3rd family gases) — Part 2: Specification for installation and maintenance of ventilation for gas appliances*.

BS 5482-1, *Domestic butane- and propane-gas-burning installations — Part 1: Specification for installations at permanent dwellings*.

BS 5482-2, *Domestic butane- and propane-gas-burning installations — Part 2: Code of practice for installations in caravans and non-permanent dwellings*.

BS 5546, *Specification for installation of hot water supplies for domestic purposes, using gas-fired appliances of rated input not exceeding 70 kW*.

BS 5871-3, *Specification for the installation of gas fires, convector heaters, fire/back boilers and decorative fuel effect gas appliances — Part 3: Decorative fuel effect gas appliances of heat input not exceeding 20 kW (2nd and 3rd family gases)*.

BS 6891, *Specification for installation of low pressure gas pipework of up to 28 mm (R1) in domestic premises (2nd family gas)*.

BS 7671, *Requirements for electrical installations — IEE Wiring Regulations*.

BS EN 1949, *Specification for the installation of LPG systems for habitation purposes in leisure accommodation vehicles and in other road vehicles*.

3 Terms and definitions

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

3.1

air heater

appliance for heating air to be used for space heating

NOTE Hereinafter referred to as “heater”.

3.2

air vent

non-adjustable, purpose-provided unit/assembly designed to allow permanent ventilation

3.3

compartment

enclosure specifically designed or adapted to house one or more gas appliances

NOTE Such an enclosure is a non-habitable space.

3.4

central heating system

fixed system for warming a building from a single source of heat with manual or automatic control of the operation of the whole system and the temperatures in the heated space

3.5

ducted-air heater

air heater using ducting to distribute the heating air

NOTE In domestic premises, this term is only used for flued heaters.

3.6

flue

passage for conveying products of combustion to the outside air

3.7

flue pipe

pipe enclosing a flue

NOTE For a double walled flue system or factory-made insulated flue system it is the inner pipe.

3.8

installation instructions

instructions prepared by a gas appliance manufacturer, giving detailed information and requirements on how the appliance should be installed and maintained

NOTE Such instructions should not be confused with other documents supplied by the appliance manufacturer, e.g. sales literature. These instructions are approved by the notified body as part of the CE marking process.

3.9

internal space

interior space which is not a room

NOTE An internal space can be a hall, passageway, stairway or landing.

3.10

intumescent air vent

assembly for preventing the spread of fire, consisting of a metal louvre or grille with an intumescent block secured behind it, which incorporates a latticework of holes to provide continuous ventilation but which expands and closes in the event of extreme heat build up as occurs in a fire

NOTE When fitted to a door, the assembly usually has a louvre or grille on both sides.

3.11

natural convection air heater

air heater designed for location within a centrally-sited convection chamber

3.12

open-flued (type B) heater

heater designed to be connected to an open-flued system, its combustion air being drawn from the room, space or compartment in which it is installed

3.13

plenum

box connected to a heater outlet that equalizes air pressure to the supply ducts

3.14**protected stairway**

stairway, including an exit passageway leading to a final exit, enclosed with a fire-resistant construction, other than any part that is an external wall of a building

3.15**room-sealed (type C) heater**

heater in which the combustion circuit (air supply, combustion chamber, heat exchanger and evacuation of the products of combustion) is sealed from the room in which the heater is installed

3.16**Se-duct**

duct rising vertically through a building, open at its extremities, and serving to bring combustion air to and to take products of combustion to the outside air from, room-sealed appliances

3.17**slot-fit heater**

heater that is specifically designed and manufactured for installation in a purpose-built recess in such a way that only the front of the heater opens into a room or internal space

NOTE On open-flued heaters, combustion air and air for dilution passes through the front of the heater's panels.

3.18**transfer grille**

non-adjustable fitment for location within a wall, door or partition, to effect the transfer of air between adjacent rooms and/or spaces

NOTE These grilles can also provide the route for combustion air, so their size has to be calculated accordingly. See BS 5440-2.

3.19**U-duct**

duct in the form of a vertical "U", the ends being open and adjacent, one limb of which provides combustion air to the bottom of the "U", whilst room-sealed appliances, (both inlet air ducts and flue outlets) are fitted to the other limb

3.20**register**

fitment equipped with a damper or movable louvres that permit adjustment or closure of an opening from which air discharges

4 Competence

4.1 Persons carrying out the design, installation and maintenance shall be competent.

4.2 The installation work shall be carried out by a business or self-employed person, who is a "member of a class of persons approved for the time being by the Health and Safety Executive (HSE)".

COMMENTARY AND RECOMMENDATIONS ON 4.2

At the time of publication, the body with HSE approval to operate and maintain a register of businesses who are "members of a class of persons" is the Council for Registered Gas Installers (CORGI).

Persons deemed competent to carry gas work are those who hold a certificate of gas safety competence acceptable to CORGI, which includes (without limitation) the Accredited Certification Scheme (ACS) and the Gas Services S/NVQ that has been aligned with ACS.

4.3 Persons who design the heating system or installation shall have a knowledge and understanding of the standards and regulations that apply to ensure that any completed plans will produce a safe and satisfactory installation.

5 Design considerations

5.1 General

The following shall be ascertained before planning of the installation begins:

- a) the number of storeys in the building, which determines the installation requirements (see 7.3);
- b) the type of building, its form of construction and its level of thermal insulation;
- c) the location, orientation and exposure of the building;
- d) the size, layout and purpose of rooms and working areas;
- e) the total heat requirements;
- f) the availability of adequate gas supplies;
- g) the best location of the heater and its flue system;
- h) the availability of adequate air for combustion and ventilation;
- i) the electrical supplies available;
- j) the water supplies available (where applicable);
- k) the provisions of any local and water bylaws; and
- l) the external controls of the heating system (see the Energy Savings Trust publication, *Good Practice Guide* 302 [11]).

COMMENTARY AND RECOMMENDATIONS ON 5.1

Collaboration is essential between those concerned with the design of the heating system and its installation, both at the planning stage and during the execution of the work.

When the layout and disposition of the various areas to be heated are known, the size, type and location of the heater required should be determined. The path of the flue system and the ventilation requirements might also affect the choice of the location of the heater. Whenever reasonably practicable, a room-sealed heater should be installed.

The design of ductwork and ancillary equipment for the heating system is dealt with in CORGI's Warm Air Heating System Design Guide [12].

5.2 Sizing the heater

The heater shall have a rated output sufficient to satisfy the heat requirements of the building as agreed between the installer or designer and the owner/occupier of the premises in which the heater is to be installed, taking into account any losses from the warm air ducting.

COMMENTARY AND RECOMMENDATIONS ON 5.2

Information on the methods for determining heat requirements and fan requirements is given in the Warm Air Heating System Design Guide [12]. Further information, particularly on heat losses and sizing, can also be found in CIBSE Guide B3 [13].

5.3 Types of heaters

The heater shall be selected to suit the operating characteristics required by the heating system's design.

COMMENTARY AND RECOMMENDATIONS ON 5.3

There are three types of heater which are categorised according to the direction of air flow through the heater:

- a) *upflow;*
- b) *downflow; and*
- c) *horizontal flow.*

Some of these can be combined with an integral water heater.

Condensing appliances are also available.