

Specification for

Installation of domestic sized gas meters (2nd and 3rd family gases)

ICS 91.140.40

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

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:

- British Flue and Chimney Manufacturers Association
- British Gas plc
- Consumer Policy Committee of BSI
- Council for Registered Gas Installers
- Department of Trade and Industry — Consumer Safety Unit, CA Division
- Health and Safety Executive
- Institute of Domestic Heating and Environmental Engineers
- Institution of Gas Engineers
- LP Gas Association
- Power Generation Contractors Association — PGCA (BEAMA Ltd.)
- Society of British Gas Industries

The following was represented on the drafting panel:

- DTI — Gas and Oil Measurement Branch

This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 March 1997

© BSI 10-1999

The following BSI references relate to the work on this standard:
Committee reference GSE/30
Draft for comment 94/715079 DC

ISBN 0 580 26824 1

Amendments issued since publication

Amd. No.	Date	Comments
9621	October 1997	Indicated by a sideline in the margin

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
Section 1. General	
1.1 Scope	1
1.2 References	1
1.3 Definitions	1
1.4 Exchange of information and time schedule	3
Section 2. Materials, components and meter location	
2.1 Materials and components	4
2.2 Meter location	4
2.3 Meter and associated controls	8
Section 3. Installation	
3.1 Handling and fixing the meter	11
3.2 Warning notices	13
Section 4. Testing and purging	
4.1 Inspection and testing for soundness	14
4.2 Purging	14
Section 5. Meter and regulator operation	
5.1 Operational checks	16
Section 6. Removal of meters	
6.1 Meter removal	17
6.2 Meter exchanges	17
Annex A (normative) Sizing of meters	18
Annex B (normative) Soundness test procedures	19
Figure 1 — Typical arrangement of meter and associated controls	5
Figure 2 — Typical gas meter boxes	7
Figure 3 — Typical domestic meters	9
Figure 4 — Typical gas meter installations	12
Table 1 — Appliance rates for regulator setting	16
Table A.1 — Diversity factors of appliances for meter sizing	18
List of references	20

Foreword

This British Standard has been prepared by Technical Committee GSE/30. It supersedes BS 6400:1985, which is withdrawn.

This revision has been undertaken because of the need to cover current practice and changes to gas installation regulations.

The following have been taken into consideration:

- a) diaphragm meters (U6);
- b) electronic token meters;
- c) mechanical token meters;
- d) electronic meters (E6);
- e) automatic meter reading systems (AMR);
- f) tilt-sensing devices;
- g) semi-concealed meters;
- h) two-storey buildings and fire proofing of meter compartments;
- i) electrical isolation of incoming mains electricity;
- j) electrical switches/lights in understairs cupboards;
- k) electrical bonding.

NOTE This standard has been written in the form of a practice specification. To comply with this specification, the user has to comply with all its requirements. He may depart from recommendations, but this would be his own responsibility and he would be expected to have good reasons for doing so.

It is essential that the appropriate specifications/codes of practice are consulted on all aspects of appliance and flue installation.

In particular, attention is drawn to the following:

- a) The Gas Safety (Installation and Use) Regulations (S.I. 1994 No. 1886). [1]
- b) The Gas Safety (Installation and Use) Amendment Regulations 1996 (S.I. 1996 No. 550). [2]
- c) The Gas Meters (Information on Connection and Disconnection) Regulations 1996 (S.I. 1996 No. 450). [3]
- d) The Building Regulations (S.I. 1991 No. 2768 [as amended by S.I. 1994 No. 1850]). [4]
- e) The Building Standards (Scotland) Regulations 1990. [5]
- f) Building Regulations (Northern Ireland) (Statutory Rules of Northern Ireland 1994 No. 243). [6]

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 20, 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.

Section 1. General

1.1 Scope

1.1.1 This British Standard specifies the requirements and gives recommendations for siting and fixing of gas meters up to 6 m³/h (212 ft³/h) rating, meter controls, meter regulators, filters and connections and subsequent termination of supply for gas at inlet pressures to the meter not exceeding 75 mbar¹⁾. This standard applies to installations supplied with 2nd family gases, and 3rd family gas (commercial propane) installations supplied through low or medium pressure distribution systems up to and including 2 bar.

The standard is applicable to the installation of gas meters conforming to BS 4161-3 and BS 4161-5²⁾ for the E6 domestic electronic gas volume meter.

Provisions for service pipes and regulators are dealt with in the Institution of Gas Engineers' Recommendations IGE/TD/4 Gas Services. [6] The installation of pipework is dealt with in BS 6891 for 2nd family gas and BS 5482-1 and BS 5482-2 for 3rd family gases.

1.1.2 Attention is drawn to the fact that the installation of gas meters is covered by the Gas Safety (Installations and Use) Regulations 1994 [1], and persons using this standard should therefore be fully conversant with those regulations.

Attention is drawn to the ofgas (Office of Gas Supply) code of practice [7] for low pressure diaphragm and electronic meters installations with badged meter capacities not exceeding 6 m³/h (212 ft³/h).

1.2 References

1.2.1 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.

1.2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

1.3 Definitions

For the purposes of this British Standard, the definitions given in BS 1179:1967 and BS 1179-6:1980 apply, together with the following.

1.3.1

cross bond

an electrical conductor connected between a point close to the outlet of a meter and the earth terminal

1.3.2

electric insulator

a fitting having high electrical resistance inserted in the service pipe or at the meter outlet to minimize the flow of electrical current

1.3.3

emergency control valve

a valve intended for use by a consumer of gas for shutting off the supply of gas in an emergency

1.3.4

index

a series of dials or rows of figures indicating the volume of gas that has passed through the meter

1.3.5

installation pipework

any pipework or fitting from the first fitting or joint after the primary meter outlet union connection to points at which appliances are to be connected.

COMMENTARY AND RECOMMENDATIONS ON 1.3

This definition varies from that given in the Gas Safety (Installation and Use) Regulations 1994 [1]

1.3.6

low pressure

gas inlet pressure to the meter regulator of not more than 75 mbar

1.3.7

medium pressure

gas inlet pressure to the meter regulator between 75 mbar and 2 bar

¹⁾ 1 mbar = 100 N/m² = 100 Pa.

²⁾ An EN is in course of preparation by CEN, which will include ultrasonic meters with a Q_{max} of 6 m³/h, referred to in this standard as E6 meters.

1.3.8 meter**1.3.8.1****credit meter**

a meter in which the volume registered by the index is the basis of a periodic account rendered to the consumer

1.3.8.2**diaphragm meter**

a positive displacement meter in which the measuring chambers have deformable walls, e.g. a U6 gas meter

1.3.8.3**electronic (ultrasonic) meter**

a meter that measures indirectly the volume of gas passing through it, e.g. an E6 electronic gas meter

1.3.8.4**gas meter**

an instrument for measuring and recording the volume of gas that passes through it, without interrupting the flow of gas

1.3.8.5**positive displacement meter**

a meter that measures directly the volume of gas passing through it

1.3.8.6**prepayment meter**

a meter fitted with a mechanism which, on the insertion of a coin or token (mechanical or electronic), permits the passage of a predetermined quantity of gas

1.3.8.7**primary meter**

the meter nearest to and downstream of a service pipe or service pipework for ascertaining the quantity of gas supplied through that pipe or pipework by a supplier

1.3.8.8**secondary meter**

a meter, other than a primary meter, for ascertaining the quantity of gas provided by a person for use by another person, whether or not there is also a primary meter in respect of the gas supplied. For billing purposes these are sometimes referred to as sub-deduct meters

1.3.9**meter box**

a receptacle or compartment designed and constructed to contain a meter with its associated gas fittings

1.3.10**meter bracket**

a purpose made support incorporating a means of securing the meter unions, from which a meter can be suspended

1.3.11**meter compound**

an area or room designed and constructed to contain one or more meters with their associated gas fittings

1.3.12**meter control valve**

the valve fitted upstream of, and adjacent to, a meter to shut off the supply of gas to it

NOTE In most cases, the meter control valve may act as the emergency control as required by the Gas Safety (Installation and Use) Amendment Regulations 1996. [2]

1.3.13**meter filter**

a filter fitted between the meter control valve and the meter

NOTE These may be integral with the meter control valve to form a filter/regulator unit.

1.3.14**meter housing**

a meter box or meter compound

1.3.15**meter regulator**

a device which controls the pressure at its outlet within predetermined parameters and which is normally fitted adjacent to and upstream of a meter

NOTE This is sometimes referred to as the meter governor.

1.3.16**meter rating**

the maximum volumetric rate of flow at which the performance of a meter is certified to be within statutory requirements or some other agreed requirement

NOTE This rate is indicated on the index of the meter.

1.3.17**non-return valve**

a device to prevent the reverse flow of gas, or air or any other extraneous gas

1.3.18**pressure test point**

a fitting provided for temporary connection of a pressure gauge

1.3.19**semi-rigid stainless steel connector**

a stainless steel tube formed with annular corrugations and having factory fitted end connections

1.3.20**service pipe**

a pipe connected to a distribution main to provide a supply of gas to one or more consumers and terminating at and including the meter control valve at a primary meter

1.3.21**service valve**

a valve (other than an emergency control) for controlling a supply of gas, being a valve:

- a) incorporated in a service pipe; and
- b) intended for use by a supplier or transporter of gas; and
- c) not situated inside a building.

1.3.22**thermal cut-off device**

a safety device designed to stop the flow of gas when the air temperature in the vicinity of the device has exceeded a predetermined value

1.4 Exchange of information and time schedule

At the initial stages of building design and planning, the party responsible for the building design and planning shall consult with the gas supplier or transporter to ensure that adequate provision is made for installing and housing a meter and associated controls capable of providing a gas supply adequate both for immediate requirements and for future extensions.

All necessary information regarding the position and housing of the meter and associated controls shall be made available to those concerned as early as possible by means of drawings, specifications and consultations.

A time schedule for fixing the meter shall be agreed as early as possible by the interested parties and any subsequent changes shall be advised at the earliest opportunity.

Any work relevant to the installation that requires attendance by trades other than the gas meter installer shall be clearly specified.

Section 2. Materials, components and meter location

2.1 Materials and components

2.1.1 All gas fittings shall be of good construction and sound material, of adequate strength and size to secure safety and of a type appropriate for the gas with which it is to be used.

2.1.2 Materials and components shall conform to the following British Standards.

BS 21:1985, *Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions)*.

BS 143 & BS 1256:1986, *Specification for malleable cast iron and cast copper alloy threaded pipe fittings*.

BS 746:1987, *Specification for gas meter unions and adaptors*.

BS 864, *Capillary and compression tube fittings of copper and copper alloy*.

BS 864-2:1983, *Specification for capillary and compression fittings for copper tubes*.

BS 1387:1985, *Specification for screwed and socketed steel tubes and tubulars and for plain end steel tubes suitable for welding or for screwing to BS 21 pipe threads*.

BS 1552:1995, *Specification for open bottomed taper plug valves for 1st, 2nd and 3rd family gases up to 200 mbar³⁾*.

BS 2871, *Specification for copper and copper alloys. Tubes*.

BS 2871-1:1971, *Copper tubes for water, gas and sanitation*.

BS 4161, *Gas meters*.

BS 4161-3:1989, *Specification for diaphragm meters of 6 cubic metres (or 212 cubic feet) per hour rating for working pressures up to 50 mbar*.

BS 4161-5:1990, *Specification for diaphragm meters for working pressures up to 7 bar*.

BS 5482, *Domestic butane- and propane-gas-burning installations*.

BS 5482-1:1994, *Specification for installations at permanent dwellings*.

BS 5482-2:1997 (1988), *Installations in caravans and non-permanent dwellings*.

BS 6956, *Jointing materials and compounds*.

BS 6956-5:1992, *Specification for jointing compounds for use with water, low pressure saturated steam, 1st family gases (excluding coal gas) and 2nd family gases*.

BS 6956-6:1992, *Specification for jointing compounds for 3rd family gases*.

BS 6974:1991, *Specification for unsintered PTFE tape for thread sealing applications (coarse threads)*.

BS EN 10242:1995, *Threaded pipe fittings in malleable cast iron*.

BS EN 29453:1994, *Soft solder alloys. Chemical compositions and forms*.

(=ISO 9453:1990)

2.2 Meter location

2.2.1 General

2.2.1.1 The location of meters inside or outside the building shall be as specified in **2.2.2** and **2.2.3**.

COMMENTARY AND RECOMMENDATIONS ON **2.2.1.1**

It is essential that the primary meter and its associated controls are fixed in a position agreed with the gas supplier or transporter.

2.2.1.2 Meters or associated controls shall not be sited:

- a) in close proximity to any source of heat or where they might be subject to extremes of temperature;
- b) where food is stored;
- c) where they might be exposed to accidental damage;
- d) where they might cause an obstruction;
- e) where they might be affected by a damp or corrosive atmosphere;
- f) where they will constitute a danger to any person;
- g) in close proximity to electrical wiring, switchgear etc.

2.2.1.3 Regulators and relief valves for medium pressure (2nd family gas) installations [see Figure 1 b)] shall not be sited inside the building. (See BS 1553-1:1977 for explanation of symbols.)

2.2.1.4 Meter installations for 3rd family gases [see Figure 1 c)] shall not be located in basements or below ground level.

2.2.1.5 Prepayment meters shall be inaccessible to unauthorized persons, but conveniently placed for easy operation of the coin or token mechanism and withdrawal of any cash box.

COMMENTARY AND RECOMMENDATIONS ON **2.2.1**

Where practicable meters should not be installed where they are exposed to extreme temperatures.

The following locations are suitable for gas meter installations:

- in a purpose made meter box or compound outside the building;
- in a garage or suitable outbuilding;
- inside the building (see **2.2.1.3**) and (**2.2.1.4**);

³⁾ BS EN 331 is in preparation, which is also relevant. This BS EN will replace BS 1552:1989 (now withdrawn).