



BSI Standards Publication

Specification for installation, exchange, relocation, maintenance and removal of gas meters with a maximum capacity not exceeding 6 m³/h

Part 2: Medium pressure (2nd family gases)

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Summary of pages

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Foreword

Publishing information

This part of BS 6400 is published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 31 December 2018. It was prepared by Technical Committee GSE/30, *Gas installations (1st, 2nd and 3rd family gases)*. A list of organizations represented on this committee can be obtained on request to its secretary.

The Technical Committee wishes to acknowledge the Institution of Gas Engineers and Managers for permission to use certain tables and figures from its publication IGE/TD/15 [1] (now withdrawn).

Supersession

This British Standard supersedes [BS 6400-2:2006](#), which is withdrawn.

Relationship with other publications

This standard is issued in three parts:

- *Part 1: Low pressure (2nd family gases);*
- *Part 2: Medium pressure (2nd family gases);*
- *Part 3: Low and medium pressure (3rd family gases).*

Terminology within this part might not necessarily be consistent with [BS 6400-3](#), which uses terminology that is consistent with the liquefied petroleum gas industry.

This standard has been prepared as a supporting document to COP/1c [2], the Ofgas code of practice for all higher pressure and all other low pressure (LP) meter installations not covered by COP/1a [3] or COP/1b [4].

Information about this document

This new edition represents a full revision of BS 6400-2, and:

- uses more up-to-date gas industry terminology;
- reflects changes in structure, practices and product availability in the gas industry;
- provides additional information on the installation, exchange, relocation, maintenance and removal of gas meters with a maximum capacity not exceeding 6 m³/h supplied from medium pressure 2nd family gas networks;
- includes clauses on inspection and maintenance, and risk assessment;
- covers meter installations of capacities not exceeding 6 m³/h in all locations (which now includes non-domestic);
- includes new figures to show the minimum proximity distances from the meter housing and the vent tip; and
- provides greater clarity on how to identify MP meter installations.

Hazard warnings

WARNING. This British Standard calls for the use of substances and/or procedures that can be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

Use of this document

It has been assumed in the preparation of this British Standard that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **G.1.1**, which states, “Requirements should be expressed using wording such as: ‘When tested as described in Annex A, the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

Contractual and legal considerations

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 cannot confer immunity from legal obligations.

Particular attention is drawn to the following specific regulations:

- a) The Gas Safety (Installation and Use) Regulations 1998 (as amended) [5];
- b) The Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004 [6];
- c) The Gas Safety (Application) Order (Isle of Man) 1996 [7];
- d) The Gas Meters (Information on Connection and Disconnection) Regulations 1996 [8];
- e) The Gas Safety (Management) Regulations 1996 [9];
- f) The Gas Safety (Management) Regulations (Northern Ireland) 1997 [10];
- g) The Gas (Meters) Regulations 1983 (as amended) [11];
- h) The Building Regulations 2010 (as amended) [12];
- i) The Building (Scotland) Regulations 2004 (as amended) [13];
- j) The Building Regulations (Northern Ireland) 2012 (as amended) [14];
- k) The Measuring Instruments (Gas Meters) Regulations 2006 [15];
- l) The Measuring Instruments Regulations 2016 [16];
- m) The Gas Act 1986 (as amended) [17].

1 Scope

This British Standard specifies requirements for the installation, exchange, relocation, maintenance and removal of credit or prepayment or smart meters of the following types: diaphragm, ultrasonic and thermal mass gas meters with a maximum capacity not exceeding 6 m³/h.

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

NOTE 2 For smart meters this standard only covers the associated gas work.

This part of BS 6400 is applicable to primary meter installations:

- a) supplied with 2nd family gases from medium pressure gas distribution systems with a maximum operating pressure exceeding 75 mbar but not exceeding 2 bar and with a design maximum incidental pressure of 2.7 bar;

NOTE 3 Some legacy MP networks can operate at a design minimum pressure (DMP) of 35 mbar, 65 mbar, 105 mbar, 180 mbar and 270 mbar.

- b) only fitted downstream of the emergency control valve;
- c) that utilize a pressure control and protection system contained within a regulator assembly that is downstream of the emergency control valve;
- d) where all gas fittings subjected to medium pressure have been pre-assembled and where strength and gas tightness testing has been undertaken on the regulator assembly at the factory;

NOTE 4 It is recognized that the final connection(s) to the gas service would not be subject to a strength test.

- e) where the operating pressure at the outlet of the meter is nominally 21 mbar; and
- f) installed external to the building.

NOTE 5 Installation, exchange, relocation, maintenance and removal of a secondary meter with a maximum capacity of 6 m³/h is specified in [BS 6400-1](#).

NOTE 6 Installation pipework is specified in [BS 6891](#).

NOTE 7 Service pipes (including the emergency control valve) are specified in the Institution of Gas Engineers and Managers' publication on gas services, IGE/TD/4 [18].

NOTE 8 All pressures quoted in this standard are gauge pressures and all pressure absorption values are for natural gas unless otherwise specified.

NOTE 9 Additional guidance on domestic gas systems can be found in the European functional standards BS EN 1775 and BS EN 12279.

NOTE 10 Additional guidance on measuring systems can be found in the European functional standard BS EN 1776.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions 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.

Standards publications

[BS 21](#), Specification for pipe threads for tubes and fittings where pressure-tight joints are made on the threads (metric dimensions)¹

¹ BS 21 has been withdrawn.

[BS 476-7:1997](#), *Fire tests on building materials and structures — Part 7: Method of test to determine the classification of the surface spread of flame of products*

[BS 746:2014](#), *Specification for gas meter unions and adaptors*

[BS 1553-1](#), *Specification for graphical symbols for general engineering — Part 1: Piping systems and plant*

BS 6400-1:2016, *Specification for installation, exchange, relocation, maintenance and removal of gas meters with a maximum capacity not exceeding 6 m³/h — Part 1: Low pressure (2nd family gases)*

[BS 6891:2015](#), *Specification for the installation and maintenance of low pressure gas installation pipework of up to 35 mm (R11/4) on premises*

[BS 7671](#), *Requirements for Electrical Installations — IET Wiring Regulations*

[BS 8499](#), *Specification for domestic gas meter boxes and meter bracket*

BS EN 331, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

BS EN 1359, *Gas meters — Diaphragm gas meters*

BS EN 10226-1, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*

BS EN 10226-2, *Pipe threads where pressure tight joints are made on the threads — Part 2: Taper external threads and taper internal threads — Dimensions, tolerances and designation*

BS EN 14236, *Ultrasonic domestic gas meters*

BS EN 60079-10-1, *Explosive atmospheres — Part 10-1: Classification of areas — Explosive gas atmospheres*

BS EN ISO 10806, *Pipework — Fittings for corrugated metal hoses*

Other publications

[N1] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGE/UP/1, *Strength testing, tightness testing and direct purging of industrial and commercial gas installations*, Edition 2 with amendments, Loughborough: IGEM, 2005.

[N2] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGEM/UP/1B, *Tightness testing and direct purging of small liquefied petroleum gas/air, natural gas and liquefied petroleum gas installations*. Edition 3 with amendments, Kegworth: IGEM, 2012.

[N3] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGEM/GM/PRS/3, *Meter regulators for gas flow rates not exceeding 6 m³/h and inlet pressures less than 75 mbar*. Kegworth: IGEM, 2017.

[N4] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGEM/GM/PRS/6, *Meter connectors*. Kegworth: IGEM, 2016.

[N5] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGEM/GM/PRS/28, *Medium pressure single-stage regulators for gas flow rates not exceeding 6 m³/h*. Kegworth: IGEM, 2016.

[N6] INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGEM/GM/PRS/29, *Medium pressure two-stage regulators for gas flow rates not exceeding 6 m³/h⁻¹*. Kegworth: IGEM, 2016.

[N7] GAS AND ELECTRICITY MARKETS AUTHORITY. *Standard conditions of gas supply licence*. Gas Act, 1986

3 Terms and definitions

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

3.1 additional emergency control valve (AECV)

valve, not being the emergency control valve, for shutting off the supply of gas in an emergency, intended for use by a consumer of gas

NOTE An AECV may be located within either the meter installation or installation pipework and, as such, might not isolate all of the consumer's pipework or meter installation.

3.2 design maximum incidental pressure (DMIP)

maximum pressure that a system is permitted to experience under fault conditions, limited by safety devices, when the system is operated at the design pressure

NOTE In the case of a medium pressure gas network in Great Britain the DMIP is 2.7 bar.

3.3 design minimum pressure (DMP)

minimum pressure that can occur at the end of any service pipe at the time of system design flow rate under extreme gas supply and maintenance conditions

NOTE 1 The DMP of a medium pressure gas network in Great Britain can be obtained from the gas transporter.

NOTE 2 In the case of a meter installation the system design flow rate is the maximum capacity of the meter installation.

NOTE 3 An extreme gas supply condition is considered to be a severe winter of the type that occurs one year in twenty.

3.4 design pressure (DP)

pressure on which design calculations are based

NOTE In the case of medium pressure gas networks in Great Britain the DP is 2 bar.

3.5 emergency control valve (ECV)

valve for shutting off the supply of gas in an emergency, which is intended for use by a consumer of gas and is installed at the end of a service

3.6 excess flow valve

device that automatically shuts off or restricts the flow of gas should it exceed a predetermined rate

NOTE The excess flow valve referred to in this standard is that which is incorporated in the meter regulator.

3.7 filter

device fitted upstream of the meter regulator to capture particles in the gas stream

3.8 gas fitting

pipework, valve, regulator, meter, fitting, apparatus or appliance

3.9 index

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

3.10 installation pipework

pipework or fitting from the outlet of the primary meter installation to points at which appliances are to be connected

NOTE This definition varies from that given in regulation 2 of the Gas Safety (Installation and Use) Regulations 1998 (as amended) [5].

3.11 insulation joint

gas fitting, with a high electrical resistance, to minimize the flow of any stray electrical current

3.12 interconnecting pipework

pipework assembled within the meter installation, additional to the pliable connector

3.13 intermediate pressure (IP)

gas supply at the outlet of the emergency control valve with a design minimum pressure exceeding 2 bar and a maximum operating pressure that does not exceed 7 bar

3.14 design maximum incidental pressure (IP)

maximum pressure that a system is permitted to experience under fault conditions, limited by safety devices, when the system is operated at the design pressure

NOTE In the case of an intermediate pressure gas network in Great Britain the DMIP is 9.31 bar.

3.15 lock-up pressure

outlet pressure of the regulator at which it shuts off completely

3.16 low pressure (LP)

gas supply with a maximum operating pressure of 75 mbar

3.17 lowest operating pressure (LOP)

lowest pressure at which a system can be operated under normal operating conditions

NOTE The gas transporter is able to advise on the LOP of the gas supply.

3.18 maximum operating pressure (MOP)

maximum pressure at which a system can be operated continuously under normal operating conditions

NOTE The gas transporter is able to advise on the MOP of the gas supply.

3.19 medium pressure (MP)

gas supply at the outlet of the emergency control valve with a maximum operating pressure that exceeds 75 mbar but does not exceed 2 bar

3.20 maximum accumulation pressure

maximum pressure that will occur in the protected system when the pressure system is discharging the expected fault flow rate

NOTE The maximum accumulation is always greater than the relief device set pressure, i.e. the pressure at which the relief device begins to operate.

3.21 meters

3.21.1 meter

instrument designed to measure, memorize and display the quantity of gas that has passed through it

3.21.2 credit meter

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

3.21.3 diaphragm meter

positive displacement meter in which the measuring chambers have deformable walls

3.21.4 positive displacement meter

meter that directly measures the volume of gas that passes through it

NOTE An example of a positive displacement meter is a diaphragm gas meter.

3.21.5 prepayment meter

meter fitted with a mechanism that, on the insertion of a coin, mechanical token or smartcard, or by the use of other electronic means, permits the passage of a predetermined volume of gas

3.21.6 primary meter

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

3.21.7 secondary meter

meter, other than a primary meter, for ascertaining the quantity of gas provided by a person for use by another person

3.21.8 semi-concealed meter

meter designed and/or specified by the manufacturer for use in a semi-concealed meter box

3.21.9 thermal mass meter

meter that comprises a laminar flow element, bypass tube, temperature sensors with supporting electronics and housing

3.21.10 ultrasonic meter

meter that infers the volume passing through it by means of the behaviour of an ultrasonic beam

3.21.11 smart meter

meter with additional functionalities, one of which is data communication

3.22 meter box

purpose-made compartment designed and prefabricated to accommodate a meter installation

3.23 meter bracket

purpose-made support incorporating a means of securing meter unions from which a meter can be suspended or its design holds the meter in place

3.24 meter compound

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

3.25 meter exchange

situation where a meter on an existing installation is replaced with another of similar capacity without modification to the associated gas fittings

3.26 meter housing

meter box or meter compound external to the building

NOTE The meter housing is not part of the meter installation.

3.27 meter inlet valve (MIV)

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

NOTE This valve cannot be deemed an ECV.

3.28 meter installation

installation that comprises a primary meter, and any associated valve, filter, meter regulator and associated protection devices, pliable connector, interconnecting pipework, fitting and support

NOTE A meter installation commences at the outlet of the ECV. Depending on the type of meter installation it terminates at:

a) the outlet connection of the meter; or

b) in the case of a semi-concealed meter installation, the outlet of the meter box outlet adaptor or the outlet of the meter where no meter box outlet adaptor is fitted.

3.29 meter regulator

device located in close proximity to a primary meter, which is solely to control the pressure of the gas within the gas meter and installation pipework

3.30 non-return valve

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

3.31 operating pressure

pressure at which a system is operating

3.32 pliable connector

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

NOTE Pliable connectors are sometimes referred to as semi-rigid connectors.

3.33 pressure absorption

difference between the pressure measured at the inlet and outlet of one or more gas fittings

3.34 pressure control and protection system

meter regulator incorporating an integral pressure control and protection devices, which maintains a controlled outlet pressure within predetermined limits of accuracy under flow conditions and ensures that the downstream pressure is kept within acceptable limits

3.35 pressure test point

gas fitting provided for temporary connection of a pressure gauge

3.36 protective bonding conductor

protective conductor provided for protective equipotential bonding

3.37 regulator assembly

factory-assembled kit comprising pressure control and protection system, meter inlet valve, interconnecting pipework and/or pliable connector

3.38 semi-concealed meter box

meter box intended to be installed partially below ground level

3.39 service pipe

pipe for distributing gas to premises from a distribution main, being any pipe between the distribution main and the outlet of the first emergency control valve downstream from that distribution main

3.40 strength test

procedure intended to verify the strength of gas fittings

3.41 vent pipe

pipe that conveys the gas from the regulator relief to the external atmosphere

4 Planning and exchange of information**4.1 Consultation**

4.1.1 At the initial stages of the building design and planning of the meter installation the party, e.g. architect, responsible for the design and planning shall consult with the relevant gas transporter or gas supplier to verify that the gas service pipe is supplied at MP and the supply is of sufficient capacity to meet the needs of all the proposed appliances. An assessment shall be made of the potential gas load to determine the required flow capacity of the meter installation. This assessment shall be carried out in accordance with [Annex A](#).

4.1.2 The designer/planner shall ensure that the proposed meter installation is capable of providing a gas supply adequate for the immediate needs of the proposed appliances.

4.1.3 The designer/planner shall establish the DMP, LOP, MOP, DP, and DMIP of the gas supply.

NOTE The request for this pressure and capacity information is obtained from the gas transporter or gas supplier, and the request may be made using an appropriate form obtained from the relevant gas transporter or gas supplier.

4.1.4 The gas transporter or gas supplier shall be consulted to ensure that adequate provision is made for siting, installing and housing the meter installation. The relevant gas transporter's authorizations, required by [Clause 7](#), shall be obtained.

NOTE The designer/planner needs to make available all information regarding the position and housing of the meter and its regulator assembly to the architect and builders, etc., as early as possible by means of drawings, specifications and consultations.

4.2 Coordination of work

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

NOTE A time schedule for fitting the meter installation needs to be agreed as early as possible by the interested parties and any subsequent changes be advised at the earliest opportunity.

4.3 Non-return valve

Where an installation uses a gas compressor, pre-mixed blown or compressed air or extraneous gas in conjunction with the gas supply, the gas meter and incoming gas supply shall be protected by a non-return valve approved by the relevant gas transporter.

NOTE The Gas Safety (Installation and Use) Regulations 1998 (as amended) [5] makes requirements on consumers that intend to use gas in a way that might cause pressure fluctuations in the supply, which could endanger other consumers. For example, regulation 38 includes a requirement for the consumer to notify the relevant gas transporter 14 days in advance of the intended activity and comply with any directions from the gas transporter.

4.4 Multiple domestic meter installations

Multiple domestic meter installations shall have a low pressure supply to the ECV and be designed and installed in accordance with [BS 6400-1](#).

NOTE Further guidance on multiple domestic meter installations is given in IGE/G/5 [19].

5 Competency

- 5.1 Persons carrying out work covered by the scope of this standard shall have the competence relevant for the task such as not to compromise the requirements of this standard and, in particular, the safe installation, commissioning and operation of gas equipment.

COMMENTARY ON [CLAUSE 5.1](#)

Competence requires sufficient knowledge, practical skill and experience to carry out the job in hand safely, with due regard to good working practice. The installation should also be left in a safe condition for use. Knowledge should be kept up-to-date with changes in law, technology and safe working practice.

There are three principal aspects to competence for work associated with gas equipment; these are:

- a) knowledge of the relevant Building Regulations [12], [13], [14];*
- b) ability to ensure that associated electrical work is to the standard required by [BS 7671](#); and*
- c) registration for “gas work” with an appropriate authority.*

It is a statutory requirement in Great Britain, the Isle of Man, Northern Ireland and Guernsey (see [Table 1](#)) that all “gas work” [item c)] be carried out by a business or self-employed person that is a member of a “class of persons” registered with a registration body which has been approved by an approval body (see [Table 1](#)) to operate and maintain such a register.

At the time of publication, the only body with approval to operate and maintain a register of individuals/businesses who are “members of a class of persons” is the Gas Safe Register. Thus, it is essential that all businesses or self-employed gas engineers are registered with the Gas Safe Register.

The qualifications which persons need to have to be deemed competent to carry out gas work are given in [Table 2](#).

Table 1 — Approval bodies and statutory regulations by country/territory

Country/territory	Approval body	Statutory regulations
Great Britain	Health and Safety Executive (HSE)	Gas Safety (Installation and Use) Regulations 1998 (as amended) [5]
Isle of Man	Health and Safety at Work Inspectorate (HSWI)	Gas Safety (Installation and Use) Regulations 1994, as amended and applied by the Gas Safety (Application) (Isle of Man) Order 1996 [7]
Northern Ireland	Health and Safety Executive Northern Ireland (HSENI)	Gas Safety (Installation and Use) Regulations (Northern Ireland) 2004 [6]
Guernsey	Health and Safety Executive for the States of Guernsey [HSE (Guernsey)]	Health and Safety (Gas) (Guernsey) Ordinance 2006 [28]

Table 2 — Competence requirements by country/territory

Qualifications	Great Britain and Isle of Man	Northern Ireland	Guernsey
Current certificate(s) of competence in the type of gas work to be conducted, issued by an awarding body accredited by the United Kingdom Accreditation Service (UKAS) Accredited Certification Scheme (ACS)	✓	✓	✓
National/Scottish Vocational Qualification (N/SVQ accredited by Ofqual), which is aligned in matters of gas safety	✓	✓	✓
National/Scottish Vocational Qualification (N/SVQ accredited by Ofqual), which is aligned under the HSC ACoP arrangement ^{A)} as approved with the registration body	✓	✓	✗
Any other scheme recognized by the gas registration body for registration purposes	✓	✓	✓

^{A)} Guidance on the individual competence required for gas work is given in IGEM/IG/1.

There are three principal aspects to competence for work associated with gas meters. These are:

- 1) be competent in their installation; and*
- 2) have an understanding of their use; and*
- 3) have an awareness of the necessary safety actions and appropriate regulations (e.g. the Gas Safety (Installation and Use) Regulations 1998 (as amended) [5]).*

This competence can be demonstrated by satisfactory completion of the relevant ACS assessment(s), which cover the installation, exchange, relocation, maintenance, removal and commissioning of domestic medium pressure natural gas meter installations.

NOTE Under the provisions of the Gas Suppliers Licence Conditions, as specified in the Gas Act 1986 (as amended) [17] either an Approved Meter Installer has to connect a gas meter, or the work has to be inspected by an Approved Meter Installer. The authority appointed by Ofgem that approves meter installers in Great Britain is the Supply Point Administration Agreement (SPAA) and an approved installer is referred to as an Approved Meter Installer (AMI).

5.2 Organizations who install MP meter installations shall be registered as Approved Meter Installers (AMIs) for COP/1c [2] installations.

5.3 All installers shall be fit and proper persons within the meaning defined in the standard conditions of the Gas and Electricity Markets Authority Gas Suppliers Licence [N7].

- 5.4** Persons who design the installation shall have a knowledge and understanding of the standards and regulations that apply to ensure that the completed plans will produce a safe and satisfactory installation.

6 Design

6.1 General

6.1.1 Selection of appropriate regulator assembly

The pressure tier of the network shall be determined prior to work commencing. Once the pressure tier is known, the appropriate regulator assembly shall be selected using the manufacturer's performance data.

NOTE If required, gas transporters can provide this information using the GDN/PM/GT/1 process.

6.1.2 Arrangement of the meter installation

The meter installation shall be arranged in accordance with [Figure 1](#). The use of a two stage regulator with an integral slam-shut valve shall not be excluded by this British Standard.

6.1.3 Gas fittings

- 6.1.3.1** All gas fittings shall be suitable for use over the complete range of pressures at which they could be required to operate, including DMP, LOP, MOP and DMIP.

NOTE Where the outlet of the ECV is incompatible with the inlet of the regulator assembly, it is acceptable to use an adaptor for the purpose of making a connection.

- 6.1.3.2** Any gas fittings within the regulator assembly upstream of point X in [Figure 1](#) shall:

- a) be capable of withstanding the DMIP advised by the gas transporter, i.e. in Great Britain this value is 2.7 bar for a primary MP meter installation;
- b) be suitable for a MOP of 2 bar; and
- c) have been strength and gas tightness tested at the factory in accordance with IGE/UP/1 [N1].

- 6.1.3.3** Any gas fittings within the regulator assembly downstream of point X in [Figure 1](#) to the outlet of the MIV shall:

- a) be capable of withstanding a pressure resulting from the operation of the final protection device; and
- b) have been strength and gas tightness tested at the factory in accordance with IGE/UP/1 [N1].

NOTE 1 Regulation 5 of the Gas Safety (Installation and Use) Regulations 1998 (as amended) [5] requires that all gas fittings be of good construction and sound material, and of adequate strength and size to ensure safety.

NOTE 2 Gas pressures on MP gas distribution systems can vary significantly according to location; for this reason the designer should ensure that these variations are taken into account in the design of gas fittings in the meter installation.

- 6.1.3.4** Where an insulation joint is fitted downstream of the ECV, this shall only be removed with the consent of the Network Operator and where a safe method of working has been established.

NOTE A generic consent for the removal of the insulation joint may be in place.

6.1.4 Gas family

All gas fittings shall be of a type that have been designed and manufactured for use with 2nd family gas.

NOTE 2nd family gases are defined in BS EN 437.

6.1.5 Flow rate

All gas fittings in the meter installation shall be designed to pass gas at a flow rate not less than the meter's maximum flow rate.

6.1.6 Connections

6.1.6.1 Any connections exposed to MP upstream of point X in [Figure 1](#) shall have unions that conform to BS EN ISO 10806 or threads that conform to BS EN 10226-1, BS EN 10226-2 or [BS 21](#).

6.1.6.2 LP connections downstream of point X in [Figure 1](#) shall have unions and adaptors that conform to [BS 746](#) or threads that conform to BS EN 10226-1, BS EN 10226-2 or [BS 21](#).

NOTE [BS 21](#) has been withdrawn however there are many existing installations where this fitting is present (e.g. ECV).

6.1.6.3 Parallel/parallel, or parallel/male to taper/female threads conforming to BS EN 10226-1, BS EN 10226-2 or [BS 21](#) shall not be used.

Figure 1 — Arrangement of a MP meter installation and options for the arrangement of the pressure control and protection system

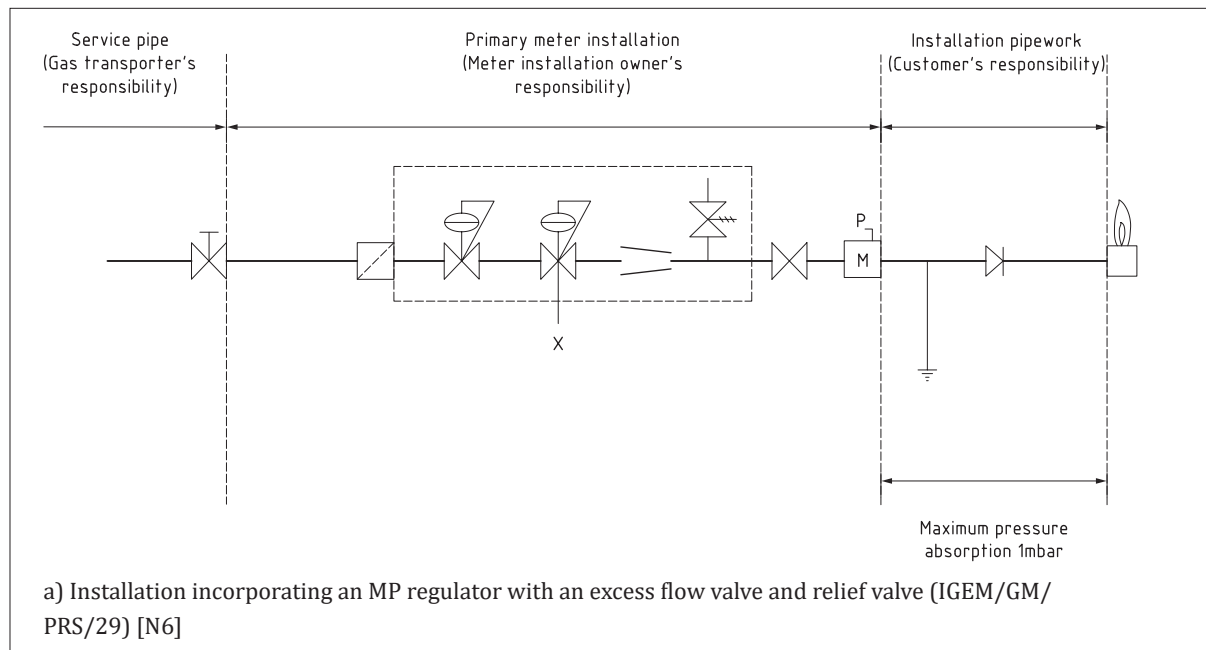


Figure 1 — Arrangement of a MP meter installation and options for the arrangement of the pressure control and protection system

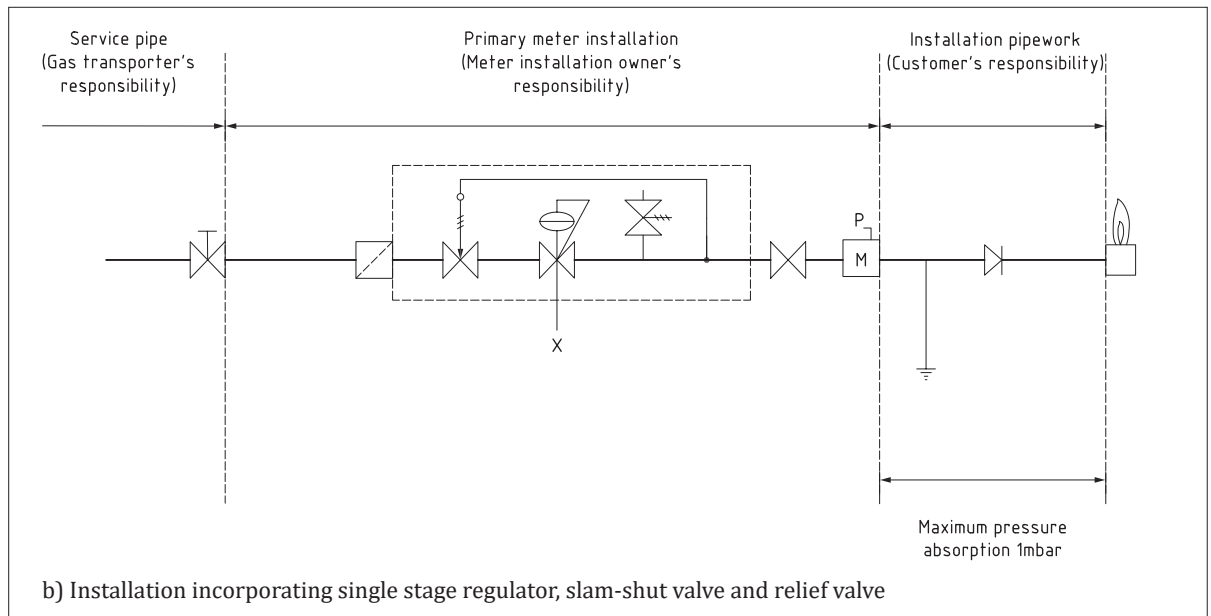


Figure 1 — Arrangement of a MP meter installation and options for the arrangement of the pressure control and protection system

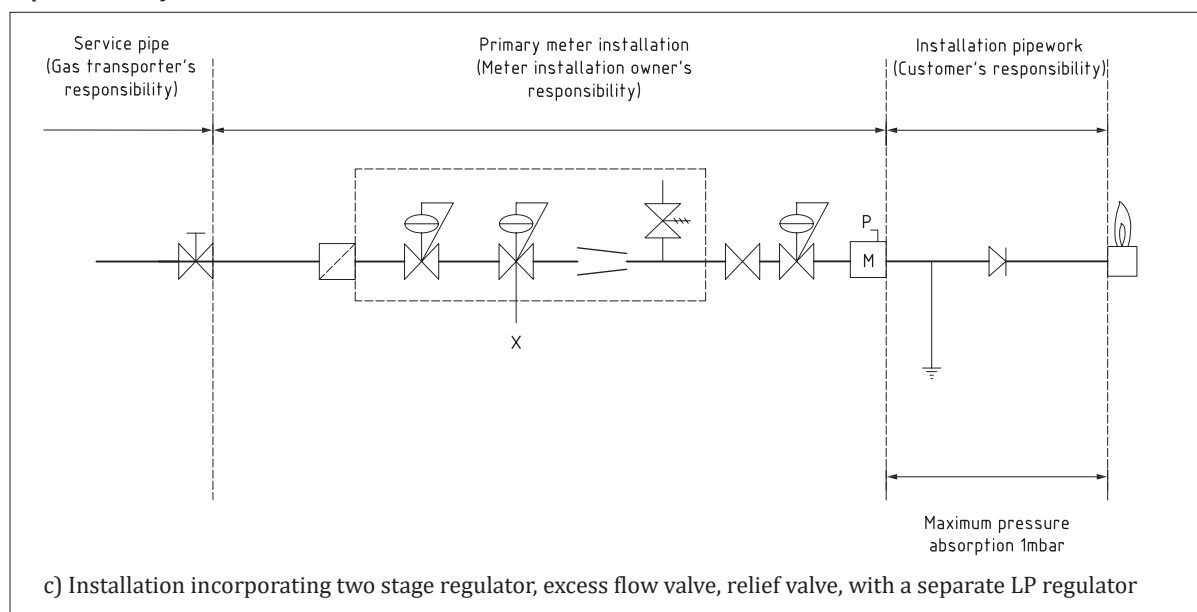


Figure 1 — Arrangement of a MP meter installation and options for the arrangement of the pressure control and protection system

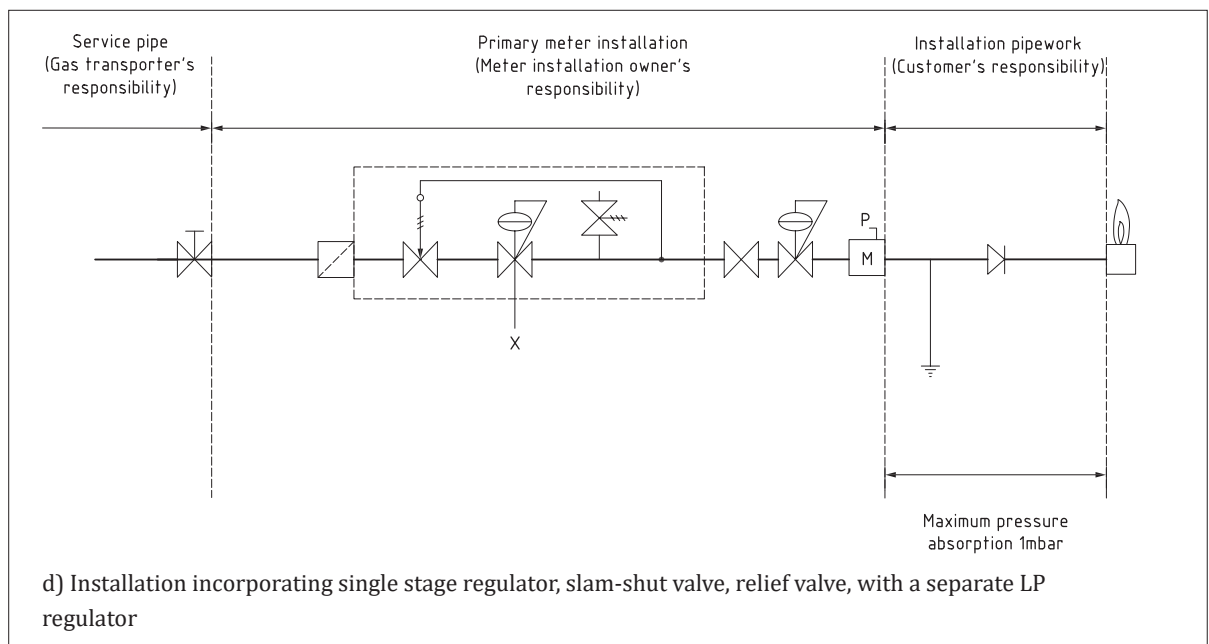
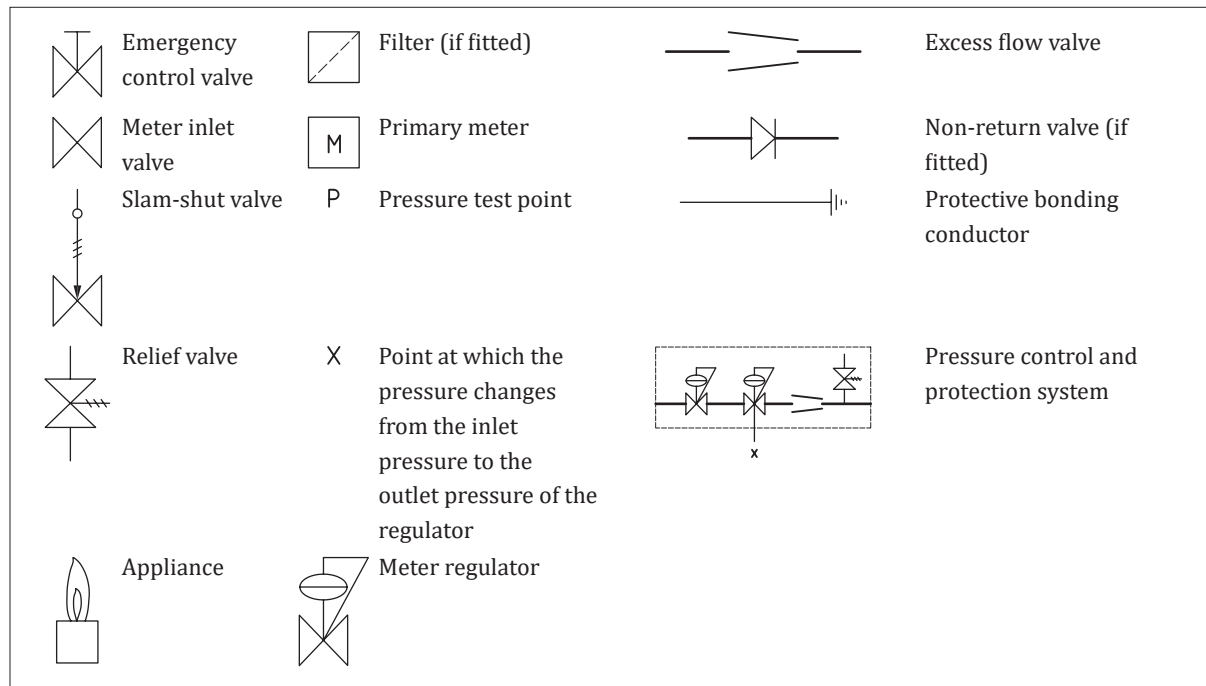


Figure 1 — Arrangement of a MP meter installation and options for the arrangement of the pressure control and protection system



6.2 Pressure control

- 6.2.1** When the operating pressure at the inlet of the regulator is in the range of DMP to MOP, the operating pressure at the inlet of the meter shall be controlled between 19.25 mbar and 24 mbar for flows in the range of 0.5 m³/h to the maximum capacity of the meter within the installation.
- 6.2.2** The design shall ensure a nominal operating pressure at the outlet of the meter installation (i.e. metering pressure) of 21 mbar.
- 6.2.3** The meter installation shall be designed such that, at gas flow rates greater than 5% of the maximum capacity of the installation, the operating pressure at the outlet of the meter installation is maintained between 15 mbar and 25 mbar when the operating pressure at the inlet of the meter installation is between the DMP and MOP.
- 6.2.4** The operating pressure at the outlet of the meter installation shall be maintained at or above 18 mbar when the operating pressure at the inlet of the meter installation is at or above LOP.
- 6.2.5** Under all circumstances (including zero flow and the failure of any one component of the protection control and protection system) with a pressure at the inlet of the meter installation up to and including DMIP, the meter installation shall protect the installation pipework, gas fittings and any appliances from being exposed to a pressure greater than the operating pressure limits given in [Annex B](#).

COMMENTARY ON 6.2

Using a IGEM/GM/PRS/28 [N5] or IGEM/GM/PRS/29 [N6], the pressure absorption between the regulator outlet and the meter inlet will need to be less than 0.75 mbar at the maximum capacity of the installation in order to meet these minimum requirements.

BS EN 1359 and the Gas (Meters) Regulations 1983 (as amended) [11] specify a maximum pressure absorption across a diaphragm meter with a maximum capacity of 6 m³/h of 2 mbar when using air, which is equivalent to 1.25 mbar for typical 2nd family gas distributed in Great Britain.