

BRITISH STANDARD

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

Part 2: Medium pressure (2nd family gases)

ICS 91.149.40

Confirmed December 2011

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British Standards

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Foreword

Publishing information

This British Standard was published by BSI and came into effect on 31 July 2006. 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].

Supersession

This part of BS 6400 partially supersedes BS 6400:1997, which will be withdrawn upon publication of all three parts of BS 6400.

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 6400:1997, 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 and removal of gas meters with a maximum capacity not exceeding 6 m³/h supplied from medium pressure 2nd family gas networks.

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.

Contractual and legal considerations

Attention is drawn to the following statutory regulations.

- a) The Gas Safety (Installation and Use) Regulations 1998 [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 and 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 2000 (as amended) [12].
- i) The Building (Scotland) Regulations 2004 (as amended) [13].
- j) The Building Regulations (Northern Ireland) 2000 (as amended) [14].
- k) The Measuring Instruments (EEC Requirements) (Gas Volume Meters) Regulations 1988 (as amended) [15].

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.

1 Scope

This standard specifies requirements for the installation, exchange, relocation and removal of credit or prepayment diaphragm and ultrasonic 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.

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;
- 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;
- e) where the operating pressure at the outlet of the meter is nominally 21 mbar.

NOTE 2 Medium pressure gas networks in Great Britain operate with maximum operating pressure in the range of 75 mbar or greater but not exceeding 2 bar with a design maximum incidental pressure of 2.7 bar.

Installation, exchange, relocation and removal of a secondary meter with a maximum capacity of 6 m³/h is specified in BS 6400-1.

Installation pipework is specified in BS 6891.

Service pipes (including the emergency control valve) are specified in the Institution of Gas Engineers and Managers' publication on gas services, IGE/TD/4 [16].

NOTE 3 All pressures quoted in this standard are gauge pressures and all pressure absorption values are for natural gas unless otherwise specified.

NOTE 4 Additional guidance on domestic gas systems can be found in the European functional standards BS EN 1775 and BS EN 12279.

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

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 746:2005, *Fittings for installation of low pressure gas meters – Requirements and test methods*

BS 6891:2005, *Installation of low pressure gas pipework of up to 35 mm (R1^{1/4}) in domestic premises – Specification*

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

BS 7372, *Guide to choice of aperture size and wire diameter combinations for industrial wire screens and woven wire cloth*

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

BS EN 1057, *Copper and copper alloys – Seamless, round copper tubes for water and gas in sanitary and heating applications*

BS EN 1359:1999, *Gas meters – Diaphragm gas meters*

BS EN 60070-10, *Electrical apparatus for explosive gas atmospheres – Part 10: Classification of hazardous areas*

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

DD ENV 14236, *Ultrasonic domestic gas meters*

DEPARTMENT OF TRADE AND INDUSTRY. *Gas Suppliers Licence: Standard Conditions*, 2001.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGE/UP/1, *Strength testing, tightness testing and direct purging of industrial and commercial gas installations*, 2003.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. IGE/UP/1B, *Tightness testing and purging of domestic sized Natural Gas installations*, 2006.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. PRS 3/E, *Meter regulators for gas flow rates not exceeding 6 m³/h and inlet pressures less than 75 mbar*, 2004.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. PRS 6/E, *Semi-rigid and flexible meter connectors*, 2004.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. PRS 28/E, *Specification for medium pressure single-stage regulators for gas flow rates not exceeding 6 m³/h*, 2006.

INSTITUTION OF GAS ENGINEERS AND MANAGERS. PRS 29/E, *Specification for medium pressure two-stage regulators for gas flow rates not exceeding 6 m³/h*, 2006.

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, may not isolate all 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 electrical insulator

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

3.6 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

3.7 equipotential bond

electrical connection maintaining various conductive parts at substantially the same electrical potential

3.8 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.

3.9 filter

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

3.10 gas fitting

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

3.11 index

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

3.12 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 [5].

3.13 interconnecting pipework

pipework assembled within the meter installation

3.14 lock-up pressure

outlet pressure of the regulator at which it shuts off completely

3.15 low pressure (LP)

gas supply with a maximum operating pressure of 75 mbar

3.16 lowest operating pressure (LOP)

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

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

3.17 maximum operating pressure (MOP)

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

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

3.18 medium pressure (MP)

gas supply at the outlet of the emergency control valve with a design minimum pressure exceeding 75 mbar and a maximum operating pressure that does not exceed 2 bar

3.19 meter

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

3.19.1 credit meter

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

3.19.2 diaphragm meter

positive displacement meter in which the measuring chambers have deformable walls

3.19.3 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.

3.19.4 prepayment meter

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

3.19.5 primary meter

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

3.19.6 secondary meter

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

3.19.7 semi-concealed meter

meter designed and manufactured for use in a semi-concealed meter box

3.19.8 ultrasonic meter

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

3.20 meter box

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

3.21 meter bracket

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

3.22 meter compound

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

3.23 meter exchange

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

3.24 meter housing

meter box or meter compound external to the building

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

3.25 meter inlet valve (MIV)

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

3.26 meter installation

installation that comprises a primary meter, valve, filter, meter regulator and associated protection devices, pliable connection, 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;*
- b) the outlet of the meter outlet adaptor if fitted; or*
- c) in the case of a semi-concealed meter with a pliable connection downstream of the meter; the outlet of the meter box outlet adaptor.*

3.27 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

3.28 non-return valve

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

3.29 operating pressure

pressure at which a system is operating

3.30 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.

3.31 pressure absorption

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

3.32 pressure control and protection system

meter regulator incorporating an integral pressure control and protection devices and supplied with gas at medium pressure, which maintains a controlled outlet pressure within pre-determined limits of accuracy under flow conditions and ensures that the downstream pressure is kept within acceptable limits

3.33 pressure test point

gas fitting provided for temporary connection of a pressure gauge

3.34 regulator assembly

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

3.35 semi-concealed meter box

meter box intended to be installed partially below ground level

3.36 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

3.37 strength test

procedure intended to verify the strength of gas fittings

3.38 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 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. When requesting pressure and capacity information from the gas transporter or gas supplier, the request shall 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 authorization shall be obtained to break the seal, set and seal the meter regulator in accordance with Clause 7.

4.2 Dissemination of information

NOTE The designer/planner should 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.

4.3 Scheduling

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

4.4 Coordination of work

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

4.5 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 [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.

4.6 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 [17].

5 Competency

5.1 Persons carrying out the installation shall be competent.

5.2 Installation work shall only 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) as required by the Gas Safety (Installation and Use) Regulations [5].

COMMENTARY ON 5.1 AND 5.2

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

Persons deemed competent to carry out 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.

5.3 Organizations who install MP meter installations shall be registered as Ofgem approved meter installers (OAMIs) for COP/1c installations [2].

5.4 All installers shall be fit and proper persons within the meaning defined in the standard conditions of the Department of Trade and Industry’s Gas Suppliers Licence.

5.5 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 Arrangement of the meter installation

The primary meter installation shall be arranged in accordance with Figure 1.

6.1.2 Gas fittings

6.1.2.1 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.

6.1.2.2 Any gas fittings 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;
- c) have been strength and gas tightness tested at the factory in accordance with IGE/UP/1.

6.1.2.3 Any gas fittings 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;
- b) have been strength and gas tightness tested at the factory in accordance with IGE/UP/1.

NOTE 1 Regulation 5 of the Gas Safety (Installation and Use) Regulations 1998 [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 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.

6.1.4 Flow rate

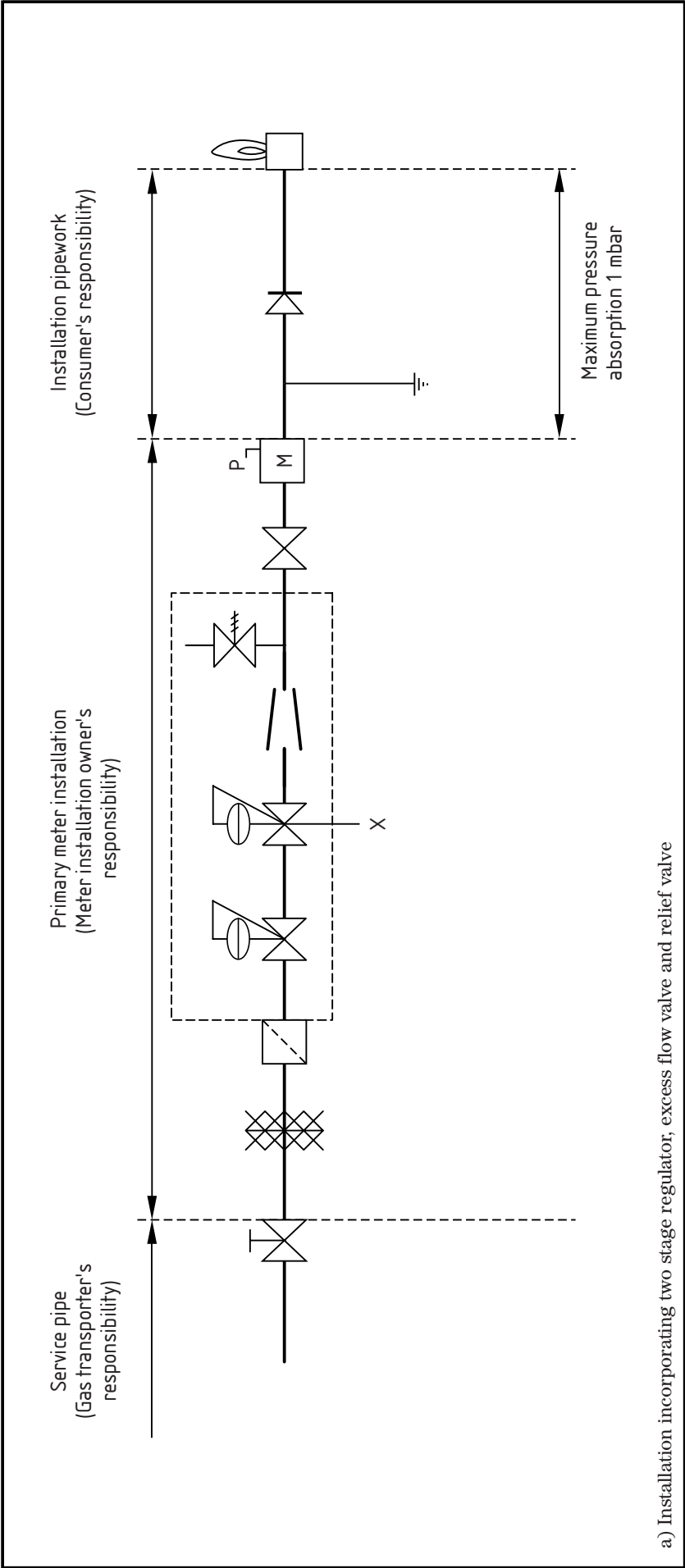
All gas fittings in the meter installation shall be designed to pass gas at a flow rate not less than the meter's maximum flow rate.

6.1.5 Connections

6.1.5.1 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 21.

6.1.5.2 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 21.

Figure 1 Arrangement of a MP meter installation and options for the pressure control and protection system
(symbols to BS 1553-1)



a) Installation incorporating two stage regulator, excess flow valve and relief valve

Figure 1



Figure 1 Arrangement of a MP meter installation and options for the pressure control and protection system
(symbols to BS 1553-1) (continued)

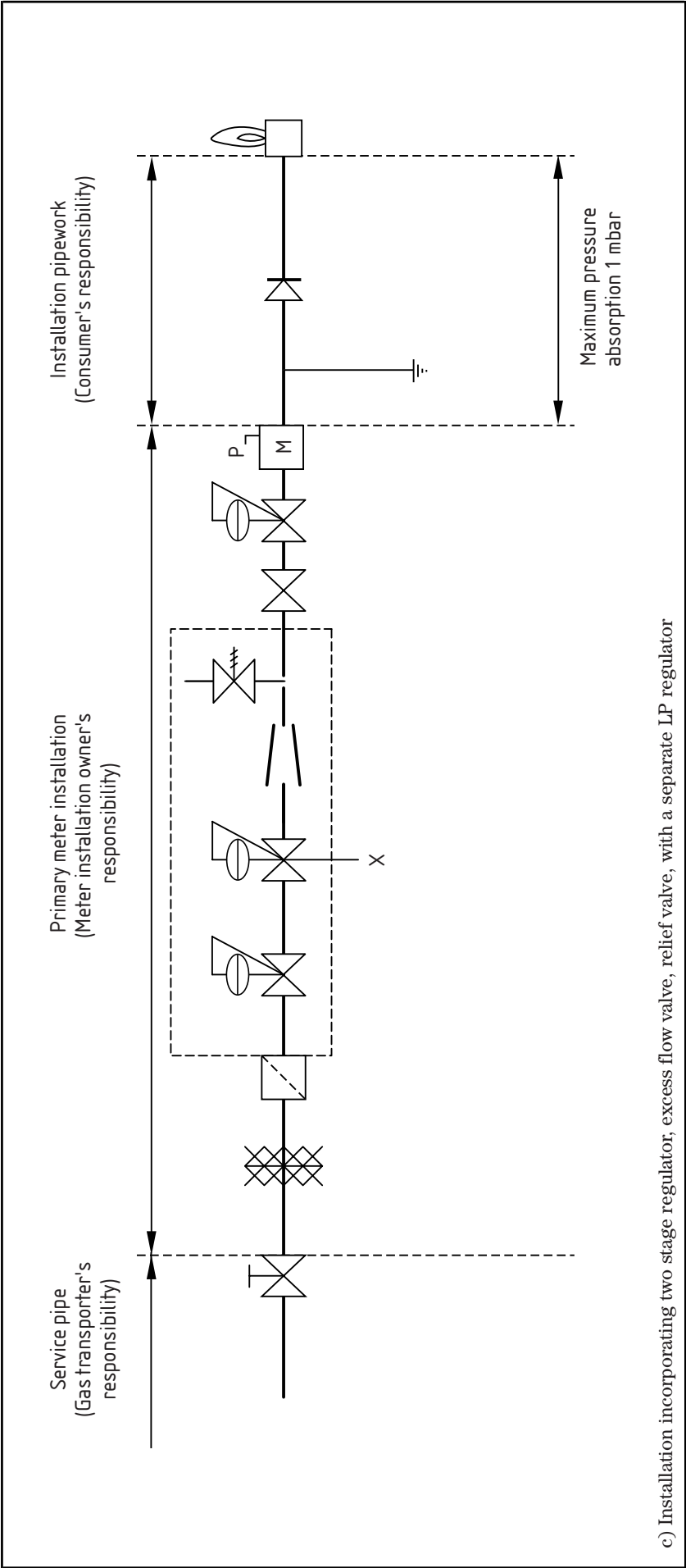


Figure 1 Arrangement of a MP meter installation and options for the pressure control and protection system
(symbols to BS 1553-1) (*continued*)

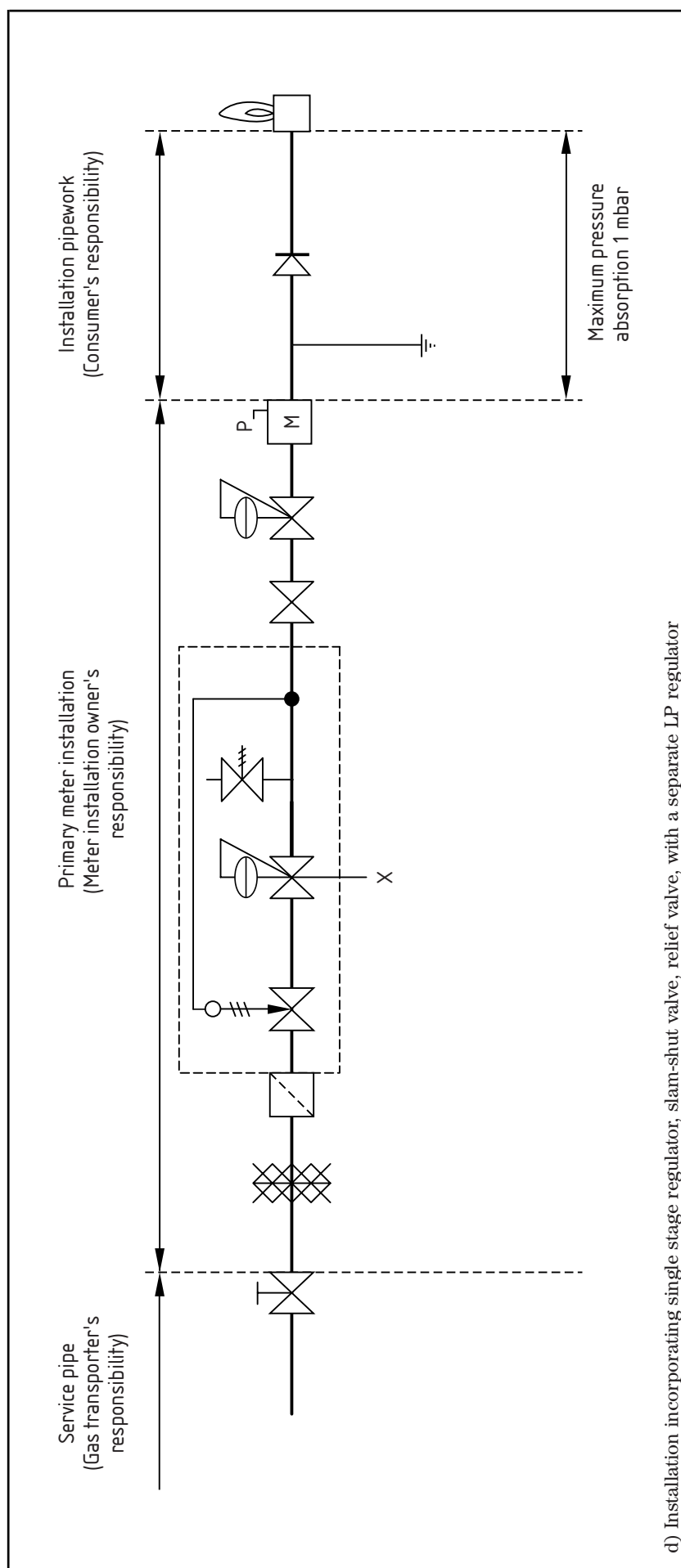


Figure 1 Arrangement of a MP meter installation and options for the pressure control and protection system
(symbols to BS 1553-1) (continued)

