

***IGEM/GM/PRS/33
Communication 1792***

***Meter regulators of nominal diameter
32 mm (1¼ inch) and not exceeding
150 mm (6 inch) and for inlet pressures
not exceeding 75 mbar***



*Founded 1863
Royal Charter 1929
Patron: Her Majesty the Queen*



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SECTION 1 : INTRODUCTION

- 1.1 This Specification is part of a series of Institution of Gas Engineers and Managers (IGEM) publications, providing a specification for selecting low pressure meter regulators.
- 1.2 British Gas and latterly, National Grid Metering (NGM) developed a series of specifications for key metering components based on its own suite of product requirements. These documents were made available to meter installers and purchasers under the title of Product Requirement Specification PRS 'e' documents. Originally, these Specifications were made available through Advantica, as they were known at the time.
- NGM has transferred the ownership of these documents to IGEM to make them available to the wider industry. It is some years since the original 'e' documents were updated and these have been withdrawn.
- 1.3 This Specification has been drafted by an IGEM Working Group, appointed and subsequently approved by IGEM's Gas Measurement Committee, and has been approved by IGEM's Technical Coordinating Committee on behalf of the Council of IGEM.
- 1.4 Manufacturers supplying low pressure (LP) meter regulators of nominal diameter (DN) from 32 mm (nominal bore (NB) 1¼ inch) not exceeding DN 150 mm (6 inch NB) and for inlet pressures not exceeding 75 mbar are to conform to the requirements of this Specification and to any other relevant documents to which reference is made herein.
- 1.5 Details on the installation of domestic-sized gas meters and associated components are given in BS 6400-1.
- 1.6 Terms such as "maximum operating pressure" (MOP), "maximum incidental pressure" (MIP) and "operating pressure" (OP) are used to reflect gas pressure terminology used in European standards. These terms will arise in all relevant IGEM Standards and, possibly, in other standards. Other new terms have been introduced to assist in recognition of design information to be transferred between interested parties.
- 1.7 This Specification makes use of the terms "must", "shall" and "should" when prescribing particular requirements.
- the term "must" identifies a requirement by law in Great Britain (GB) at the time of publication
 - the term "shall" prescribes a requirement which, it is intended, will be complied with in full and without deviation
 - the term "should" prescribes a requirement which, it is intended, will be complied with unless, after prior consideration, deviation is considered to be acceptable.
- Such terms may have different meanings when used in legislation, or Health and Safety Executive (HSE) Approved Codes of Practice (ACoPs) or guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.
- 1.8 New and improved products, materials or production methods may be adopted prior to this Specification being updated. Amendments to this Specification will be issued when necessary and their publication will be announced in the Journal of IGEM and elsewhere as appropriate.

- 1.9 Requests for interpretation of this Specification in relation to matters within its scope, but not precisely covered by the current text, should be addressed to Technical Services, IGEN, IGEN House, High Street, Kegworth, Derbyshire, DE74 2DA or by e-mail to technical@igem.org.uk. Such requests will be submitted to the relevant Committee. Any advice given by or on behalf of IGEN does not imply acceptance of any liability, and does not relieve any party of their obligations.
- 1.10 This Specification was published in September 2016.

SECTION 2 : SCOPE

- 2.1 This Specification provides requirements for meter regulators for use with:
- 2nd family gas (see BS EN 437)
 - low pressure distribution Networks (with pressures as defined in GDN/PM/GT/1, see A2.5 in Appendix 2 and Appendix 5 of IGEN/GM/8)
 - meter installations complying with IGEN/GM/6 and IGEN/GM/8
 - a nominal outlet pressure of 21 mbar and
 - nominal diameter DN32 (1¼ inch NB) and not greater than DN150 (6 inch NB).

Note: GDN/PM/GT/1 defines the following pressures at the inlet to the meter installation:

- maximum incidental pressure – upstream (MIP_u) = 200 mbar
- maximum operating pressure – upstream (MOP_u) = 75 mbar
- lowest operating pressure – upstream (LOP_u) = 25 mbar
- design minimum pressure – upstream (DmP_u) = 19 mbar.

- 2.2 This Specification sets out the requirements for product type and production testing.
- 2.3 This Specification requires consideration of the life cycle of the product and its potential effect on the environment.
- 2.4 All pressures quoted in this Specification are gauge pressures unless otherwise stated.
- 2.5 Italicised text is informative and does not represent formal requirements.
- 2.6 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms “must”, “shall” or “should”.

SECTION 3 : LEGAL AND ALLIED CONSIDERATIONS

- 3.1 This Specification is set out against a background of Legislation in force in GB at the time of publication. The devolution of power to the Scottish, Welsh and Northern Ireland Assemblies means that there may be variations to the Legislation described below for each of them and consideration of their particular requirements must be made. Similar considerations are likely to apply in other countries where reference to appropriate national Legislation is necessary.
- 3.2 All relevant Legislation must be applied and relevant ACoPs, official Guidance and referenced codes, standards, etc. have to be taken into account.
- 3.3 Unless otherwise stated, the current editions of Legislation and standards apply.
- 3.4 In the absence of specific Legislation, it is essential that installations are designed, constructed, installed, operated and maintained so as to be safe.
- 3.5 The Legislation appropriate to any installation will depend largely upon its location. Advice will need to be sought from the relevant Authorities.
- 3.6 Appendix 2 lists Legislation, Guidance Notes, Standards etc. which are identified within this Specification as well as further items of Legislation that may be applicable. Where British Standards, etc. are quoted, equivalent national or international standards, etc. equally may be appropriate.

SECTION 4 : REGULATOR CONSTRUCTION

4.1 SAFETY

4.1.1 The manufacturer shall ensure that all items supplied are safe and without risk to health when properly used by operators during handling and installation and during normal use.

4.1.2 Items shall be packaged to ensure that they can be handled safely.

4.2 PRESSURE RATING

Regulators shall be able to withstand an inlet pressure of 350 mbar without damage.

4.3 GENERAL

4.3.1 Regulators shall be of good workmanship and made from good quality, serviceable materials and be suitable for external and internal installation without undue corrosion occurring and without impediment to operation.

4.3.2 Regulators shall:

- be spring loaded
- be balanced against inlet pressure effects
- have valves that are open at rest, and
- be internally impulsed.

4.3.3 All parts of regulators shall be free from any sharp edges and corners that might cause damage, injury or incorrect operation.

4.3.4 Holes for screws, pins, etc. used for the assembly of parts of the regulator and for mounting, shall not penetrate gas-ways. The wall thickness between these holes and gas ways shall be at least 1 mm.

4.3.5 Holes necessary during manufacture, which connect gas-ways to the atmosphere but which do not affect the function of the regulator, shall be permanently sealed by metallic means.

Note: Suitable jointing compounds may additionally be used.

4.3.6 Closure parts that may be dismantled for servicing or adjustment shall be so constructed that tightness will be achieved by mechanical means e.g. metal to metal joints and O-rings; this excludes all jointing compounds, such as liquids, pastes and tapes.

Tightness shall be maintained after dismantling and reassembling.

Jointing compounds may be used for permanent assemblies where they shall remain satisfactory under normal operating conditions.

Closure parts that are not to be dismantled during servicing or adjustment shall be sealed by a means which will show evidence of interference, e.g. lacquer.

4.3.7 Parts that require dismantling e.g. for servicing shall be capable of being dismantled and reassembled with standard tools and shall be so constructed or marked that, following the instructions of the manufacturer, incorrect assembly is discouraged.

Screwed fastenings that may be removed during servicing shall have metric threads complying with BS 3643-1.

Self-tapping screws that cut a thread and produce swarf shall not be used for connecting gas carrying parts or parts that may be removed in servicing. Self-tapping screws that form a thread and do not produce swarf may be used. Such screws that do not produce swarf shall permit replacement by metric machine screws with threads conforming to BS 3643-1.

4.3.8 The function of moving parts e.g. diaphragms, spring adjusters, etc. shall not be impaired by other parts.

4.3.9 Breather holes shall be designed such that they are:

- suitably protected against the ingress of contamination and water
- not unduly restricting the movement of the diaphragm
- protected against blockage or located so that they do not easily become blocked
- arranged such that any cleaning instrument inserted through the breather hole cannot damage the diaphragm
- threaded to facilitate connection of a suitable vent pipe.

4.3.10 If a safety diaphragm is used as a leakage rate limiter, it shall not take the place of the working diaphragm in the event of a fault.

4.3.11 The outlet pressure adjustment facility shall be readily accessible to authorised persons.

4.3.12 Regulators shall be capable of being sealed with a sealing tie to prevent unauthorised adjustment; the size of the sealing tie hole shall be 2.5 mm (minimum).

Note: The sealing tie is to provide evidence of unauthorised tampering of the regulator setting.

4.4 MATERIALS

4.4.1 General material requirements

Regulators shall be constructed of materials conforming to appropriate British Standards or equivalent.

The quality of materials used; the dimensions and the method of assembling the various parts shall be such that construction and performance characteristics are safe.

The performance characteristics shall not alter significantly during a reasonable life i.e. at least ten years, maintenance free when the regulator is installed and used according to the manufacturer's instructions. Under these circumstances, all components shall withstand any mechanical, chemical and thermal conditions to which they are normally subjected during service.

4.4.2 Solder

Soldering or other processes where the jointing material has a melting point below 450 °C after application shall not be used for joining gas-carrying parts, except for additional sealing.

4.4.3 Body/Housing

4.4.3.1 The body/housing of regulators shall be cast in:

- a) aluminium alloy (LM4) EN AC-43000, (LM6) EN AC-44100, EN AC-44300 , (LM24) EN AC-46500 or (LM25) EN AC-42000 to (BS 1490) BS EN 1706 or

Note: BS 1490 has been withdrawn.

- b) iron to BS EN 1561 or
- c) any other material, deemed suitable by the purchaser.

4.4.3.2 With the exception of the requirements in clause 4.4.3.3, parts of the housing that separate a gas-carrying compartment from the atmosphere, or that are separated by a diaphragm from the gas-carrying compartment shall be manufactured only of metallic materials.

4.4.3.3 It shall be permitted for a gas-carrying part to be made of non-metallic material provided that upon removal or fracture of this non-metallic part, under all circumstances no more than $30 \text{ dm}^3 \text{ h}^{-1}$ of air can escape at the maximum inlet pressure of 75 mbar.

Note: This clause is not intended to cover O-rings, gaskets and seals, including the static parts of diaphragms.

4.4.4 **Resistance to corrosion and surface protection**

Any part in contact with gas or the surrounding atmosphere, including springs, shall be manufactured from corrosion-resistant materials or shall be suitably protected. The corrosion protection for springs and other moving parts shall not be impaired by any movement.

4.4.5 **Impregnation**

Where necessary, a production-line treatment such as impregnation e.g. vacuum or internal pressure, is permissible, but shall be carried out using an appropriate procedure and appropriate sealing materials.