IGEM
Institution of
Gas Engineers & Managers

IGEM/GM/7A
Communication 1731

Electrical connections for gas metering equipment

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OBJECTIVES OF IGEM/GM/7A

See Appendix 1 for an explanation of acronyms and abbreviations.

IGEM/GM/7A provides requirements for the selection, installation, inspection and maintenance of electrical equipment connected to gas meter installations by:

- ensuring electrical equipment will not be a source of ignition
- ensuring compliance with DSEAR and the ATEX Directives
- describing suitable electrical equipment
- describing how to safely connect electrical equipment.

Electrical work involved with gas meter installations may appear to be relatively simple, for example plugging in an energy management system (EMS). However, such work has to be undertaken correctly and IGEM/GM/7A prescribes requirements to ensure the safe installation and long term use of the equipment.

Conversely, the electrical work may be very complex, for example on a commercial installation having several pieces of equipment using pulse outputs. IGEM/GM/7A describes the pulse hierarchy in such circumstances and how best to ensure the reliability of the interconnections and equipment.

IGEM/GM/7A describes in detail the differences in equipment classification regarding potential hazardous areas into which it may be fitted. Many low pressure gas installations will have relatively simple requirements in this respect.

IGEM/GM/7A applies to all electrical equipment and systems that are connected either directly or indirectly to any gas meter or associated equipment, such as automatic meter reading devices, pulsers, conversion devices, data loggers, EMSs, etc.

IGEM/GM/7B describes methods by which hazardous areas can be determined i.e., their classification (Zone 1, Zone 2, etc.) and the distances over which they extend. It is particularly relevant to more complex gas installations at higher pressures and includes descriptions of relief valve vent stack zoning which is unlikely to be found on simpler installations.

Requirements for the differing levels of competency when working on various types of gas installation are also provided in IGEM/GM/7A.

No matter what type of work is being carried out, the following list represents key requirements that need to be achieved:

- appropriate levels of competency to do the type of work involved
- for addition of equipment to a gas meter or connected equipment generally, authorisation by the party responsible for the meter/equipment
- appropriate labelling of equipment and ensuring they are left in place and readable
- meter indexes have to be left such that they remain unobstructed
- meter installation equipment on non-domestic premises requires an EX label to be fitted in the appropriate place(s)
- any electrical circuit attached to a gas meter installation has to be an "approved circuit"
- for non-domestic installations, all equipment has to be suitable for the hazardous area into which it is fitted, as determined by using IGEM/GM/7B
- after connection, consideration of the provision of a spare pulse output
- appropriate inspection/maintenance.

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APPENDICIES

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SECTION 1 : INTRODUCTION

1.1 This Standard supersedes the relevant scope, i.e. electrical connections for gas metering equipment, of IGE/GM/7 Edition 2, Communication 1702, which is obsolete. The remaining scope of IGE/GM/7 Edition 2, i.e hazardous area classification of gas metering equipment, has been superseded by IGEM/GM/7B, Communication 1732.

1.2 This Standard has been drafted by an Institution of Gas Engineers and Managers (IGEM) Panel, appointed by IGEM's Gas Measurement Committee, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of the Council of IGEM.

1.3 This Standard has been developed for use by parties which make electrical connections to a gas meter (hereafter referred to as "meter") for a volume conversion device, automatic meter reading (AMR) facilities, data logging equipment, energy management systems (EMS), other pulse outputs, etc., irrespective of ownership of the meter or equipment. As such, the Standard will be of use to gas suppliers, end users, shippers, gas transporters (GTs), meter asset managers (MAMs), installation contractors, EMS installers, equipment manufacturers and consultants.

The Standard will also be of assistance to designers and manufacturers when designing or specifying associated equipment.

1.4 This Standard has a similar scope to the relevant scope of IGE/GM/7 Edition 2, but includes much additional and enhanced information, including on meter pulse utilization (MPU). It is written such that it complements the Office of Gas Supply (OFGAS) Codes of Practice (CoPs), the Office of Gas and Electricity Markets (Ofgem) MAMCoP and the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

1.5 This Standard is not retrospective. However, where work needs to be undertaken on a meter installation, it is recommended that such an installation be brought into line with this Standard.

1.6 The de-regulation of the metering market has led to the need for new sets of rules and Standards. This has been addressed by the Ofgem Meter Asset Manager Code of Practice (MAMCoP), developed to cover whole life management of gas meter installations. The OFGAS CoPs 1/a, 1/b and 1/c, which cover the installation of the meter only, will continue to apply. Businesses installing meter installations are required to be an Ofgem approved meter installer (OAMI). There has also been a review and harmonisation of industry standards and CoPs to reflect the needs of the changing market.

Note: Under the new arrangements, an Ofgem-approved MAM does not have to be an OAMI, but has an obligation to use an OAMI to install a meter.

Notwithstanding Sub-Section 1.10, total compliance with IGEM/GM/7A is necessary for installations and modules where the meter installation has to comply with the Ofgem MAMCoP, relevant scope.

In addition, OFGAS/Ofgem has developed guidance notes on best practice for the reading of gas meters with which OAMIs will have to comply. The notes state that any AMR installation shall conform with IGE/GM/7 (which is obsolete and has been superseded by this Standard and IGEM/GM/7B).

1.7 This Standard makes use of the terms "should", "shall" and "must" when prescribing particular requirements. Notwithstanding Sub-Section 1.10:

- 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 Code 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 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example "responsible engineers", are allowed to exercise their professional judgement does not allow employers to abrogate their primary responsibilities. Employers must:

- have done everything to ensure, so far as it is reasonably practicable, that "responsible engineers" have the skills, training, experience and personal qualities necessary for the proper exercise of professional judgement
- have systems and procedures in place to ensure that the exercise of professional judgement by "responsible engineers" is subject to appropriate monitoring and review
- not require "responsible engineers" to undertake tasks which would necessitate the exercise of professional judgement that is not within their competence. There should be written procedures defining the extent to which "responsible engineers" can exercise their professional judgement. When "responsible engineers" are asked to undertake tasks which deviate from this, they should refer the matter for higher review.

1.9 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted in a more appropriate manner to avert them.

It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due regard be paid to HS(G)48.

1.10 Notwithstanding Sub-Section 1.7, this Standard does not attempt to make the use of any method or specification obligatory against the judgement of the responsible engineer. Where new and better techniques are developed and proved, they should be adopted without waiting for modification to this Standard. Amendments to this Standard will be issued when necessary, and their publication will be announced in the Journal of the Institution and other publications as appropriate.

1.11 Requests for interpretation of this Standard in relation to matters within its scope, but not precisely covered by the current text, should be addressed in writing to Technical Services, The Institution of Gas Engineers and Managers, Charnwood Wing, Holywell Park, Ashby Road, Loughborough, Leicester, LE11 3GH and will be submitted to the relevant Committee for consideration and advice, but in the context that the final responsibility is that of the engineer concerned. If any advice is given by or on behalf of IGEM, this does not relieve the responsible engineer of any of his or her obligations.

SECTION 2 : SCOPE

2.1 This Standard covers electrical equipment and connections for gas metering equipment.

For the purposes of this Standard, "electrical equipment and connections" includes optical equipment and connections, unless otherwise stated.

2.2 This Standard applies to meter installations of maximum operating pressure (MOP) not exceeding 100 bar.

Additional requirements may need to be applied for installations having extensive communications systems, flow computers, etc.

2.3 This Standard applies to meter installations containing Natural Gas (a 2nd family gas as defined by BS EN 437) in a gaseous state.

Note: This Standard does not apply to either compressed or liquefied Natural Gas (CNG or LNG) installations, for example as supplied at CNG vehicle filling stations.

Ambient temperatures are assumed to be in the range –25°C to 55°C.

2.4 This Standard applies to primary and secondary meter installations and associated volume conversion equipment in industrial, commercial and domestic premises, installed in accordance with IGE/GM/4 (see Note 4), IGEM/GM/5, IGE/GM/6, IGE/GM/8, BS 6400-1 or BS 6400-2, respectively and, where applicable, a hazardous area classification has been carried out in accordance with IGEM/GM/7B or IGE/SR/25, as appropriate.

For an existing meter installation, this Standard applies only to new equipment being fitted for the first time or replacing existing electrical equipment i.e. it does not apply for existing equipment not being replaced.

Note 1: A meter installation in domestic premises is an installation within, or near to, a domestic dwelling into which the installation supplies gas and where it is reasonable to expect that the householder will be in the vicinity of the installation on a regular basis. Such installations using a "domestic meter" will be installed in accordance with BS 6400-1 or -2, as appropriate.

Note 2: A meter installation in industrial or commercial premises is an installation within the boundary of the industrial and commercial premises within which the gas load is located and where it is reasonable to expect that passers–by will be in the vicinity of the gas installation on a regular basis. This is to distinguish this type of installation from a remote site, for example a National Transmission System above-ground installation, where it is reasonable to expect that persons will not be present for long periods of time.

Note 3: Many of the principles of IGEM/GM/7A will apply to other gas meter installations having an unlimited installation pressure, for example at transmission boundary interfaces where gas measurement may take place. However, consideration would need to be given to the special circumstances affecting such installations, for example the remoteness of the site, high gas pressures and large gas volumes.

Note 4: For equipment installed in accordance with IGE/GM/4, an additional assessment will be required to ensure suitability.

2.5 This Standard considers:

- DSEAR and ATEX Directives
- competency
- pulse ownership
- equipment certification and suitability
- equipment connections
- details of electrical connections
- labelling
- records and reporting.

2.6 Advice is provided on:

- legal requirements
- authorisation procedures
- electrical low frequency (LF) and high frequency (HF) outputs
- design of electronic interface equipment
- ensuring integrity of installation, operation and maintenance of a pulse chain
- procedures for telephone connections
- equipment location and installation
- equipment connection, protection and isolation
- earthing
- inspection and maintenance.

2.7 This Standard applies to the connection of any electrical equipment to a gas meter, including:

- a volume conversion device
- AMR facilities
- add-on pulse modules
- a data logger
- an EMS
- a tamper circuit.

2.8 This Standard does not address any requirements relating to "gas work" under the Gas Safety (Installation and Use) Regulations (GS(I&U)R).

2.9 All pressures quoted are gauge pressures unless otherwise stated.

2.10 Italicised text is informative and does not represent formal requirements.

2.11 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms "should", "shall" or "must".