

Introduction

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i. General

This guide is continually reviewed and updated to be a definitive guide for individuals training as domestic gas engineers utilising Liquefied Petroleum Gas (LPG) and, for practicing gas engineers, to be a useful reference source when going about your day-to-day work. The following sub-sections of this LPG On Site Guide have been amended from Version 4 (ISBN: 978-1-906091-86-6), printed September 2017 –

Section	Amendments
Section 1	Updated reference to Gas Safety (Installation and Use) (Amendment) Regulations 2018.
Section 2	Amendment to Section 2.5 table to reintroduce a column for Natural Gas characteristics (in response to requests from training providers).
Section 3	Minor editing to some terminology used and general alignment to sister publication (Domestic Gas Safety On Site Guide).
Section 4	Addition of an example to sub-section 4.3.3 and editing of text in Section 4.7 regarding OPSO provision for regulators complying with BS EN 16129.
Section 5	General editing to align with UKLPG CoP 1: 2017, amended values provided in Table 5.1, updated information on separation distances for flammable materials in sub-section 5.7.1 and a general correction to numbering system.
Section 6	Edited text in Section 6.0 regarding regulators complying with BS EN 16129 and the requirement for OPSO protection, sub-section 6.0.1 on regulator operation, sub-section 6.0.2 on ACD operation and references to both IGEN/G/11 and GS(I&UR) (Amendment) 2018.
Section 8	Correction to calculation in Section 8.6.
Section 9	Amendment to sub-section 9.2.1 to include BS EN ISO 10380 hoses, amended text on LPG hoses complying with BS 669-1 and updated figures 9.38 - 9.41 on notching and drilling joists.
Section 10	Minor amend to renumber section from 10.4 onwards.
Section 12	Minor correction to example (point a.) in sub-section 12.2.5.4.
Section 13	New entry (13.0.8) for BS EN ISO 10239: 2017 - doesn't alter technical aspects of this Section – and reference to IGEN/G/11.
General Editorial	Terminology and standards referenced throughout the Guide have been reviewed and as required, updated. Additionally and as appropriate, Content pages to each Section have been realigned to address discrepancies within this publication and its sister publications, the Domestic & Non-Domestic Gas Safety On Site Guide.

The LPG guide builds on the information contained within the Domestic Gas Safety On Site Guide (Parts 1 & 2) as many of the installation aspects are transferable between Natural gas and LPG. However, the guide provides additional information specific to LPG and its use within Permanent Dwellings (PD), Residential Park Homes (RPH), Caravans and Leisure Accommodation Vehicles (LAV) and Boats (B), and as such will be applicable to those gas engineers undertaking a fuel changeover assessment from Natural gas to LPG under the Nationally Accredited Certification Scheme for Individual Gas Fitting Operatives (ACS).

It is important to note however that the Gas Safety On Site Guide series **is not to be considered as a substitute** for the source documentation (i.e. Regulations, Industry Standards produced by the British Standards Institution (BSI), the Institution of Gas Engineers and Managers (IGEM), UKLPG and other industry Codes of Practice) and as such gas engineers are reminded that they should have access to the source documentation.

Neither should the On Site Guides be considered as a substitute for the Manufacturer's Instructions (MIs), which shall be complied with at all times unless otherwise permitted by that Manufacturer; in such a case, ensure you obtain written confirmation of the deviation/concession, leaving a copy with the responsible person for the gas installation for future reference.

In terms of the source documentation, a cost effective solution for gas businesses is provided by Gas Safe Register and their Standard Subscription Service, which for a small annual fee provides subscribers access to BSI, IGEM & UKLPG documentation; visit <https://engineers.gassaferegister.co.uk>

Alternatively each standard body provides commercial services to obtain standards in either their printed or electronic format –

visit:

- BSI – <http://shop.bsigroup.com>
- IGEM – <http://shop.igem.org.uk/default.aspx>
- UKLPG – <http://uklpg.org/shop/codes-of-practice>

ii. Scope

The Liquefied Petroleum Gas Safety On Site Guide, via its 14 Sections confines itself to matters related to 'domestic' LPG (commercial Propane and Butane) installations, that is to say:

- Maximum Operating Pressure (MOP) at the outlet of the final stage regulator of –
 - » Butane - 28 mbar; and
 - » Propane - 37 mbar
- Installation pipework maximum nominal bore of 35 mm (DN32, R 1¹/₄)
- Maximum Installation Volume (IV) of 0.035 m³
- Maximum rated capacity through the primary meter, if fitted, of 6 m³/h, and
- Gas appliances having a maximum individual heat input rate of no greater than 70 kW net.

The 14 Sections are configured to cover: Section 1 to 10 permanent dwellings; Section 11 Leisure Accommodation Vehicles; Section 12 Residential Park Homes, Section 13 Boats, yachts and other vessels and Section 14 Mobile cabinet heaters.

The Liquefied Petroleum Gas Safety On Site Guide deals with core elements of every gas engineers underpinning knowledge, including but not limited to: legislation; characteristics of LPG; LPG cylinders and bulk storage vessels installations; service and installation pipework, tightness testing and purging, and gas appliance specifics relevant to PD/RPH/LAV/B.

Domestic gas engineers should also reference the Domestic Gas Safety On Site Guide available from NICEIC Direct - www.shop.niceic.com

Non-domestic gas engineers who deal with industrial and commercial installations may also refer to the Non-Domestic Gas Safety On Site Guide for further guidance.

iii. Conventions

The writing style of the On Site Guides is informative and as such may supplement that which is stated within a particular regulation, standard or Code of Practice (CoP). This style of writing not only provides the general requirements of industry, but also allows the editors to impart their knowledge and experience as practiced gas engineers.

That said and for reasons of parity, the On Site Guides also adopts terms used by both British Standards and IGEN of “must”, “shall” and “should”:

- The term “must” identifies a requirement by law in Great Britain
- 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.

iv. Gas Engineers Responsibilities

Competent Gas Safe registered engineers must undertake any gas work in a safe and workman like manner, ensuring that their work complies with the regulations in force, the MI's and the various standards/CoPs applicable to the work activity at hand.

It is widely accepted that human error plays a significant part in industry accidents, i.e. a given action lead to an unsafe situation arising or conversely, inaction to avert the danger. Given this, engineers are reminded to manage their work activities (i.e. the human factors involved) as well as controlling any risk present/introduced by that work activity.

Additional guidance can be obtained via the Health and Safety Executive (HSE) and their publications:

- HSG48 'Reducing error and influencing behaviour'
- HSG65 'Managing for health and safety'

These and many other useful publications are freely available as a 'download' from the HSE website - www.hse.gov.uk/guidance – and can be purchased in a hard copy format.

v. Employers Responsibilities

In a similar vein to that of competent engineers, their employers must ensure that they comply with their principle legal duties and these cannot be abdicated to the engineers professional judgement alone.

An employer must:

- Ensure, as far as reasonably practical, there are no better protective measures that can be taken than relying on the exercise of 'professional judgement',
- Ensure, so far as practicable, that the responsible engineer has the necessary skills, training, experience and personal qualities to exercise 'professional judgement',
- Ensure systems are in place to monitor and review the exercise of 'professional judgement' by responsible engineers,
- Ensure responsible engineers do not undertake task that require them to exercise their professional judgement beyond their competence - written procedures should be in place defining the extent of 'professional judgement' that can be exercised.

Additional guidance for employers can be obtained from the HSE – www.hse.gov.uk/risk – and their publications:

- INDG163 (rev 4) 'A brief guide to controlling risks in the workplace'.
- INDG449 (rev 1) 'Health and safety made simple – The basics for your business'.