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Correct Sizing of Cylinders

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Introduction

When you turn a cylinder on and fire up a gas appliance, there is a release of pressure and the Liquefied Petroleum Gas (LPG) in the cylinder is vaporised into a gas. This is called the “Off take”.

The Off take and flow rate of gas will be limited by the size of the cylinder.

As the cylinder starts to empty the “Off take” will decrease until the liquid level in the cylinder can no longer deliver the flow of gas required.

If the gas supply is undersized, it can make the installation unsafe! Under sizing may lead to incomplete combustion and the production of Carbon Monoxide (CO), a harmful poisonous gas.

Make sure that the gas supply is more than adequate for the appliances in use, to minimise the risk of incomplete combustion.

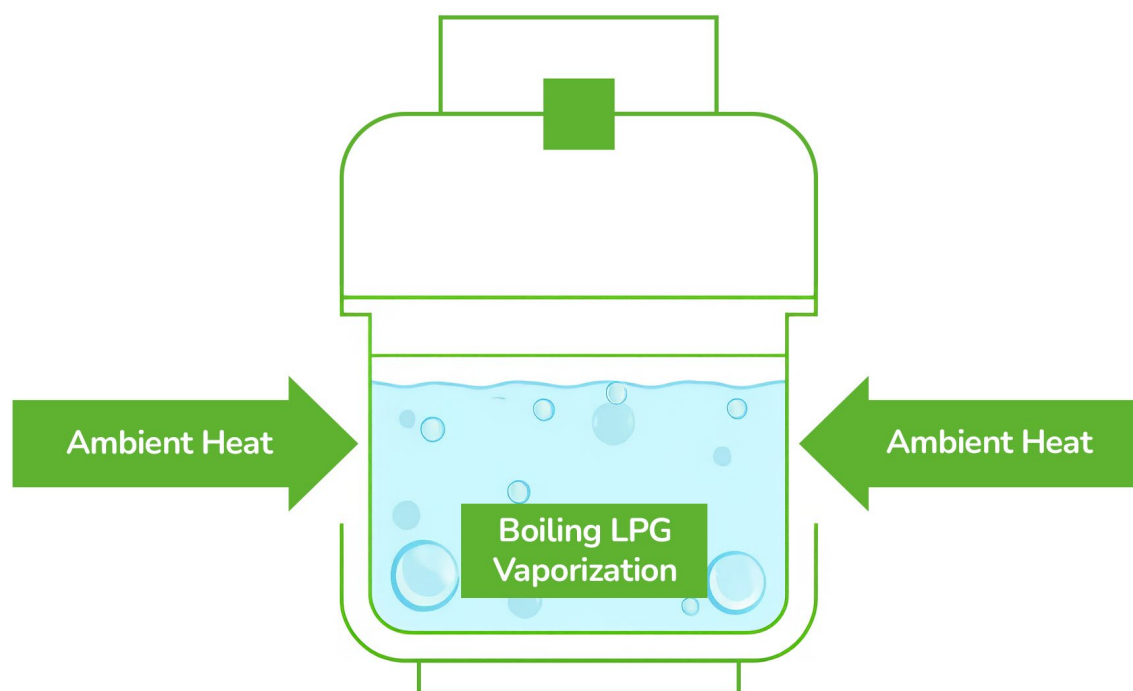


Image – The liquid to gas reaction in a cylinder known as the “Off-take”.

Correct Sizing of Cylinders

The number of cylinders required will depend on the number and type of appliances installed.

It is vital that the maximum available offtake for the cylinder capacity is always greater than that of the maximum power (kilowatts) of the appliance to be used (or the combination of multiple appliances if connected to the same cylinder).

For continuous use, multiple cylinders can be installed in banks, interconnected via an auto changeover or manual manifolded device.

The simplified table below shows the rate of gas that is achievable by the cylinder size and the sort of appliances that can be powered.

Table: Correct Sizing of Propane Cylinders

CYLINDER SIZE	OFF-TAKE Kg/h	Kw/h	EXAMPLE APPLIANCE
13 kg	1.054	14.0	LPG Generator, Small griddle, ring burner, small counter fryer.
19 kg	1.319	18.3	Large griddle, Commercial BBQ.
47 kg	2.373	33.0	Floor standing Fryer, 4 burner range.

Image -The Quick Safe Rig, an example of the correct method of connecting multiple cylinders.



Key:

Kg/h – Kilograms per hour

kW/h – kilowatts per hour

Kg – Kilograms

The appliances being used will determine what size and how many cylinders are required. Refer to the table to determine the size of cylinder/ how many cylinders are required for the appliances used.

A suitably qualified Gas Safe Registered Engineer will be able to work out the correct sizing of cylinders when carrying out a gas installation and should check this during annual gas safety checks.

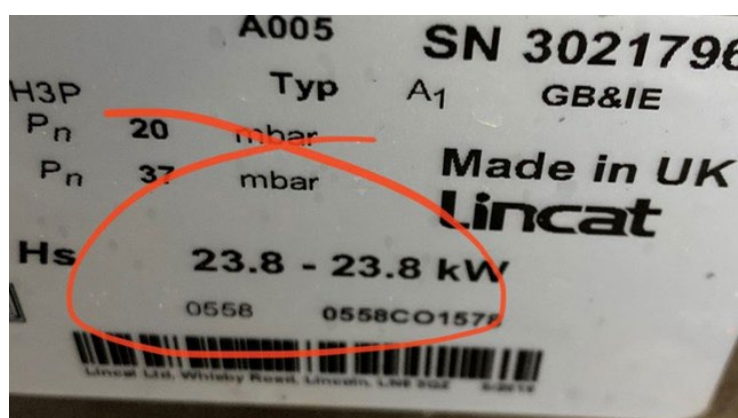


How to check the gas flow rate of appliances

Check the data plate on an appliance to work out how much gas it needs (off-take Kg/h) to safely achieve its maximum power (kilowatts).

An appliance that is suitable for use will have CE/UKCA/UKNI conformity marking on the data plate. The data plate contains important information e.g. suitable fuel type, kW/h or kg/h.

Some relevant examples are shown below.

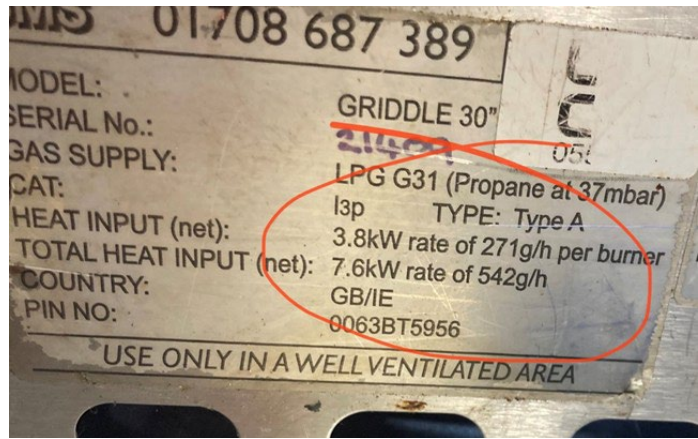


Example 1

This shows the data plate on a Lincat 4-burner range oven. This indicates that it has a maximum power output of 23.8 kW/h and would therefore require 47Kg cylinder (or manifolding 2 x 19kg cylinders) to provide the required offtake.

Example 2

This shows the data plate on a griddle. This indicates that it has a maximum power output of 7.6kW/h and would therefore require a 13Kg cylinder.



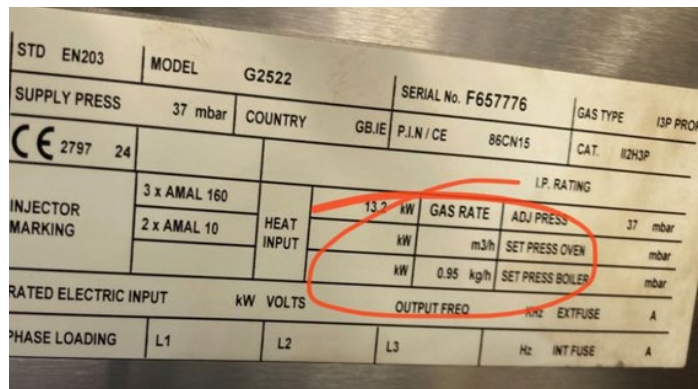
Example 3

This shows the data plate on Fracino Coffee Machine. To achieve its maximum power output of 3.25kW/h this could be supplied with a 13Kg cylinder.



Example 4

This shows the data plate salamander grill. To achieve its maximum power output of 13.2kW this could be supplied with a 19Kg cylinder.



Safety Warning

- ✘ Do not shake cylinders or use concentrated heat sources e.g. cylinder blankets, to deliberately increase the flow rate/offtake of gas. This could cause an imbalance of pressure within the cylinder and make it volatile/ at risk of explosion.

- ✘ A telltale sign that a cylinder is undersized is a wall of frost forming at the base of the cylinder. Do not ignore the signs of frosting on cylinders! Ensure that cylinder sizing and the appliances in use are checked by a Gas Safe Engineer competent in LPG without delay.

- ✘ Be aware of the symptoms of Carbon Monoxide poisoning and ensure that the health and wellbeing of everyone in the work area is protected.

Image – A frosting cylinder, an indication that the cylinder is undersized for the appliances in use and incomplete combustion is occurring.



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