BRITISH STANDARD

BS EN 521:1998

Incorporating Corrigendum No. 1

Specification for dedicated liquefied petroleum gas appliances — Portable vapour pressure liquefied petroleum gas appliances

The European Standard EN 521:1998 has the status of a British Standard

ICS 27.060,20; 91.140.20

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GSE/24, Dedicated LPG appliances, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

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This British Standard, having been prepared under the direction of the Engineering Sector Board, was published under the authority of the Standards Board and comes into effect on 15 June 1998

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Festlegungen für Flüssiggasgeräte — Tragbare, mit Dampfdruck betriebene Flüssiggasgeräte

This European Standard was approved by CEN on 21 May 1997.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 181, Dedicated liquefied petroleum gas appliances, the Secretariat of which is held by NSAI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1998, and conflicting national standards shall be withdrawn at the latest by July 1998.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports the essential requirements of EU Directive(s).

For the relationship with EU Directive(s), see informative annex ZA, which is an integral part of this standard.

This standard only applies to type testing.

Items relating to quality assurance systems, production testing and, particularly, certificates of conformity of auxiliary equipment are not covered by this standard.

Particular attention should be paid to the suitability of non-metallic materials used in the construction of these appliances. A European Standard (PrEN 1763) for “Flexible hose, tubing and assemblies for use with butane and propane in the vapour phase” is being prepared by CEN 218. This standard will be applicable to these types of appliances.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies the construction and performance characteristics related to safety and the rational use of energy of portable appliances burning liquefied petroleum gases at the vapour pressure within the gas container. It also defines test methods and the requirements for marking and the information to be given in the instructions.

NOTE These appliances are referred to in the body of the text as "appliances".

This standard applies to various types of portable appliances burning liquefied petroleum gases at vapour pressure and designed to be used with (non-refillable) cartridges as complying with EN 417 or any types of gas cylinders other than cartridges. For example the following types of appliances are covered:

a) cooking appliances (hotplates, grills, barbecues...);

This standard does not cover barbecues which can be used indoors.

b) lighting appliances;

c) heating appliances:

This standard only applies to appliances with a maximum heat input of up to 3 kW (H_s) for outdoor use only.

d) blowlamps;

This standard only applies to blowlamps without a flexible hose.

e) laboratory burners.

The requirements apply to these appliances or their functional sections whether or not the latter are independent or incorporated into an assembly.

This standard only applies to type examination.

Appliances covered by this standard are not connected to a flue for the discharge of products of combustion and are not connected to the mains electricity supply.

This standard covers neither appliances supplied with LPG in the liquid phase nor those incorporating a fixed gas reservoir which may or may not be refilled by the user. This standard does not cover gas containers or flexible hose.

It does not apply to smokers lighters covered by EN 29994.

Requirements for rational use of energy have been included for hotplate burners.

However, such requirements have not been included for the other types of appliances because:

— for grills and barbecues, this is a type of cooking which is achieved by various means such as radiant elements; in addition this type of cooking varies according to the type of food and region where the appliance is used;

— for lighting appliances, the consumption is insignificant because these appliances have a very low rate and are used only for a few hours in a year;

— for heating appliances, all the heat produced is discharged into the environment;

— for tools such as blowtorches which are not professional tools in regular use, the gas consumption depends very much on the way it is used.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of their publications apply to this European Standard only when incorporated in it by amendment or revision. For undated reference the latest edition of the publication referred to applies.

EN 30-1-1, *Domestic cooking appliances burning gas — Part 1-1: Safety — General.*

EN 125, *Flame supervision safety devices for gas burning appliances — Thermoelectric flame supervision devices.*

EN 417, *Specifications for non-refillable metallic cartridges for liquefied petroleum gases, with or without a valve, for use with portable appliances — Construction, inspection and marking.*

EN 549, *Rubber materials for seals and diaphragms for gas appliances.*

EN60335-1:1988, *Safety of household and similar electrical appliances — Part 1 : General requirements.*

EN 29994, *Smokers lighters — Safety requirements.*

ISO 301, *Zinc alloy ingots intended for casting.*

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1

cooking device

devices supplied with the appliance designed to hold or receive the food to be cooked (grid, turnspit, baking tray, etc.)

3.2

detachable

that which can be dismantled without using a tool

3.3

vapour pressure appliance

the pressure at the inlet of the appliance is equal to the pressure in the gas container

if the appliance is fixed directly to the gas cylinder by a rigid connection, the appliance inlet is the part of the connection which takes the gas from the cylinder; a pressure reducing device may be incorporated in the gas circuit, between the gas inlet and the injector

if the appliance is connected to the gas container by a flexible hose, the pressure in the flexible hose once it is connected to the gas container is equal to the pressure in the gas container; a pressure reducing device may be incorporated in the gas circuit downstream of the flexible hose

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3.4

appliance with fixed integral container
(see clause **1**)

appliance incorporating a gas container which is not intended to be disconnected for refilling

3.5

auxiliary equipment

the controls and devices that can affect the safety of operation of a gas appliance (for example valves, flame supervision devices)

3.6

barbecue

appliance designed principally to roast and/or grill food; cooking is carried out by radiant heat and, possibly, by convection

3.7

locking of an adjuster

locking of an adjuster by the manufacturer or by an installer, in its adjustment position by any means (a screw,...)

3.8

soft solder

solder for which the lowest temperature of the melting range, after application, is less than 450 °C

3.9

turnspit

cooking device enabling the rotation of the food to be roasted; its rotation can be manual or using a mechanical or electrical motor (battery)

3.10

burner

component that allows the gas to burn:

— ignition burner: small burner whose flame is designed to light a main burner; it is referred to as "pilot" in this standard;

— main burner: burner designed to fulfil a thermal function of the appliance it is referred to as "burner" in this standard

3.11

gas cartridge

non-refillable container with a maximum capacity of 1 000 ml filled with gas or a gas mixture

it may be fitted with a valve; if it is not fitted with a valve, the release of gas is carried out following perforation of the cartridge by means of a device incorporated in the appliance

3.12

heat input

product of the mass rate and the gross calorific value of the gas brought to the same reference conditions; it is expressed in kilowatts

the nominal heat input of a burner is the value of the heat input declared by the manufacturer

3.13

flame lift

phenomenon characterized by the partial or total movement of the base of the flame away from the burner port

3.14

removable

that which can only be removed with a tool

3.15

ignition device

device to ignite one or more burners directly or indirectly

3.16

flame supervision device

device which, due to the presence of a flame on the sensing element, keeps open the gas flow to the burner and any pilot and which cuts off the gas supply to the burner and possibly a pilot in the event of extinction of the supervised flame

3.17

grid

cooking device designed to hold the food to be cooked; its useful component(s) can be rigid or flexible

3.18

grid with flexible useful components (wallet grid)

grid with flexible useful components is made up of two jointed components enabling tight gripping of the food to be cooked; each component consists of a rigid frame on which metallic wires are fixed and form a flexible mesh inside the frame distorting around the food

3.19

griddle

part of a hotplate consisting of a plate placed above a burner, that allows the cooking of food by direct contact with the surface of the plate which is brought to a high temperature

3.20

radiant grill

appliance or part of an appliance allowing cooking by radiation from a surface brought to a high temperature

3.21

pan support

support placed above an open hotplate burner and designed to support the pan to be heated

3.22

glass panel

glass surface or part of a glass surface allowing the inside of an enclosure to be seen

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3.23

injector

component part that admits the gas into an aerated burner

NOTE An injector is said to be calibrated when the section of the outlet orifice is fixed.

3.24

control handle

component designed to be operated manually so as to operate a control of the appliance, such as a tap, thermostat, etc

3.25

means of sealing

any static or dynamic device designed to ensure soundness, for example: flat-faced joints, O-ring or conical joints, diaphragms, grease, pastes, putties...

3.26

gripping area

outside part of the appliance designed to be handled in normal use

3.27

primary air adjuster

device allowing the primary aeration rate of a burner to be set to a predetermined value according to the supply conditions

the action consisting in operating this device is termed "primary air adjustment"

3.28

gas rate adjuster

device allowing the gas rate to a burner to be set at a predetermined value according to the supply conditions

the adjustment can be continuous (adjustment screw) or discontinuous (change of calibrated orifices)

the action of changing the setting of this device is termed the "adjustment of the gas rate"

3.29

useful part of a cooking device

part of the device in contact with food during cooking

3.30

calorific value

quantity of heat produced by complete combustion at a constant pressure of 1 013 mbar, of unit mass of the gas, the constituents of the gas mixture being at 0 °C or 15 °C, 1 013 mbar and the products of combustion being brought to the same conditions

in this standard, the gross calorific value (symbol H_s) is used, that is to say that the water produced by combustion is assumed to be condensed

the calorific value is expressed in units of energy per unit of mass of dry gas. It is expressed in megajoules per kilogramme (MJ/kg)

3.31

gas supply pressure

difference between the static pressure measured at the gas inlet connection of the appliance and the atmospheric pressure; it is expressed in bar

3.32

hotplate

cooking appliance incorporating one or several burners and a pan support(s) designed in such a way that it (they) can support the vessels containing the food

3.33

hotplate with grill

cooking appliance consisting of a hotplate and a radiant grill

3.34

light back

phenomenon characterized by the return of the flame inside the body of the burner

3.35

tap

device designed to isolate a burner from the gas supply pipework and possibly to adjust its rate during use

3.36

sealing of an adjuster

any means of locking an adjuster, such that any attempt to change the adjustment causes the breaking of the sealing device or sealing material and makes the interference with the adjuster apparent; the adjuster is said to be sealed in the adjusted position

a factory sealed adjuster is considered as non-existent

3.37

stabilizer

device which is integral with an appliance or which can be fixed to it designed to increase stability

3.38

flame stability

flames are stable at the burner ports when the phenomena of flame lift or light back do not occur

3.39

ignition delay time

time between the ignition of the supervised flame and the moment when the effect of this flame is sufficient to keep the closing device open

3.40

extinction delay time

time between the extinction of the supervised flame and the closure of the gas supply to the burner and possibly a pilot

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4 Classification

4.1 Classification of gases

Gases likely to be used are classified in three groups according to their pressures:

a) Butane:

Mixture of hydrocarbons containing mainly butanes and butenes having a maximum pressure of 8 bar gauge at 50 °C.

b) Butane-propane mixture:

Mixture of hydrocarbons containing mainly butanes, butenes, propane and propene having a pressure between 8 bar gauge and 12 bar gauge at 50 °C.

c) Propane:

Mixture of hydrocarbons containing mainly propane and propene having a pressure above 12 bar gauge at 50 °C.

4.2 Categories of appliances

Appliances are classified in three categories according to the gases likely to be used :

— category direct pressure — butane;

— category direct pressure — butane-propane mixture;

— category direct pressure — propane.

5 Safety requirements

5.1 General

The test methods and the means of verification are indicated in clause **6**.

5.2 Conversion to different gases

Unless necessary so as to adjust the flame for various types of work (for example: tools such as blow lamps, laboratory burners), the appliances shall not incorporate any adjuster (other than controlling the gas flow) intended to be adjusted by the user.

5.3 Materials

Non-metallic materials used as radiant elements in appliances (for example volcanic rocks, refractory blocks) shall be of a quality suitable to their use. The appliance manufacturer shall give the identification of the element to be used in the user instructions.

The quality and thickness of materials used in the construction of appliances shall be such that the constructional and performance characteristics are not altered in use. In particular all the parts of the appliance shall withstand mechanical, chemical and thermal actions to which they may be submitted during use. In normal conditions of operation, of cleaning or of adjustment, they shall not be liable to any alterations which might impair their performance.

Sheet-metal parts, not made of corrosion-resistant material, shall be effectively protected against corrosion. This requirement does not apply to grilles supporting lava rocks nor to cooking devices.

Seals and joining compounds shall have characteristics suited to their use.

Rubber based materials shall comply with EN 549.

Copper tubing shall be used upstream of the injector only if its temperature does not exceed 100 °C when the test described in **6.21** is carried out.

Asbestos or asbestos based materials shall not be used.

The nature and finish of materials likely to be in contact with food shall be such that they cannot contaminate or affect the food.

Zinc alloys shall not be used in contact with gas unless they are of ZnAl4 or ZnAl4Cu in accordance with ISO 301 and provided that such parts do not exceed a temperature above 80 °C under the test conditions in **6.21.**

With the exception of seals, parts in contact with gas shall not be made of plastics.

5.4 Assembly, cleaning and maintenance

5.4.1 *Assembly*

The entire appliance gas circuit, including the injector, shall be assembled by the manufacturer.

Parts, whose assembly is carried out by the user, shall be able to be assembled correctly by following the instructions given in the instructions.

It shall not be possible to dismantle parts which are adjusted at the factory, which are not intended to be dismantled by the user and whose dismantling would affect safety, without using tools. If dismantling is possible using an open ended spanner or a screwdriver, direct access to such nuts and screw heads shall not be possible, unless they are sealed.

If a pressure reducing device is integrated in the gas circuit (see **3.3**), it shall not be removable nor replaceable by the user. This device may provide the functions of adjustment, opening and closing of the gas flow.

The appliance gas circuit shall not incorporate a reservoir placed between the appliance gas inlet connection and the valves, intended to receive part of the gas in the liquid phase contained in the supply vessel during connection.

5.4.2 *Cleaning, maintenance*

All parts of the appliance requiring frequent cleaning by the user shall be easily accessible. It shall be possible to put these parts back correctly.

There shall be no sharp corners and edges on the accessible parts of an appliance which could give rise to injury, for example during cleaning.

5.5 Strength and stability

5.5.1 *Strength*

5.5.1.1 *General*

The construction of an appliance shall be such that, during normal conditions of use

— any displacement of parts;

— any distortion;

— any deterioration

likely to impair safe operation will not occur.

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5.5.1.2 *Hotplate pan supports*

The application of a mass as described in **6.5.1.2** on the pan support shall not cause any breakage or permanent distortion of the pan support exceeding 1 mm.

5.5.1.3 *Glass components*

The accessible edges of glass components shall not be sharp. They shall withstand the various stresses to which they are subjected during the tests described in this standard without damage. In particular they shall withstand the tests described in **6.5.1.3.1** (when they are a part of the appliance) and in **6.5.1.3.2**.

5.5.2 ***Stability***

If the appliance is fitted with a foldable support, it shall be possible to lock this in the position of use (for example: stop, locking device).

If the radiant device of a barbecue or a grill can have several positions, a stop shall be provided for each of them.

The stability of an appliance designed to rest on a table or on the ground shall allow safe use on level ground. In addition, the appliance shall not tilt or fall over when it is placed on a slope of 10° and any lid shall not close.

This requirement shall also be met when the appliance is fitted with optional parts (for example: lamp extension posts).

These requirements shall be met under the test conditions described in **6.5.2**.

5.6 Soundness of the gas circuit assembly

Holes for screws, pins, etc., intended for the assembly of components shall not open into the space reserved for the gas ways leading to the injector.

The soundness of parts and assemblies connected to the gas circuit shall be assured by means of metal-to-metal joints or joints with seals (for example, flat-faced joints, O-rings or gaskets), i.e. excluding the use of any product which ensures soundness in the threads. For parts that do not require to be dismantled during normal maintenance, for example taps, the use of thread sealing compounds is permitted.

Removable components or the threaded parts of the gas pipework which may be dismantled during normal maintenance shall remain sound after five disconnections and re-connections in accordance with the instructions, if necessary after changing a gasket.

Soft solder (see definition in **3.8**) shall not be used to ensure the soundness of the gas circuit. However it is permitted for internal connections within the gas circuit when they do not involve soundness. Conformity shall be verified based on the manufacturer's specifications.

Under the test conditions defined in **6.6.1**, during each of the tests no. 1 and 2, the leak shall not exceed 0,07 l/h (1 013 mbar, 20 °C). This requirement shall also be met after all the tests on the appliance have been carried out, but before any dismantling of parts subjected to the soundness tests.

5.7 Connections

5.7.1 ***General***

Whatever the type of gas container (pierceable cartridge, cartridge fitted with a valve, cartridge with or without centre boss, refillable reservoir...), when following the instructions, connection of the appliance to the gas container shall be easy with minimal, if any, gas leakage.

For appliances with direct rigid connection to the gas container(s), the CE Type Examination technical file for the appliance shall include diagrams and specifications of the gas containers (including their gas outlet connections) intended for the gas supply to the appliance.

5.7.2 ***Appliances directly fitted to the gas container***

5.7.2.1 *Appliances fitted to pierceable cartridges*

a) When following the indications given in the instructions, it shall not be reasonably possible to pierce the cartridge unless it is properly secured in the appliance.

b) The cartridge holder and the piercing device shall be such that:

1) the piercing is centred in the position provided;

2) soundness is ensured before piercing;

3) after the fitting of the cartridge, it shall not be possible to remove it, without abnormal effort, without first having to remove the piercing device.

5.7.2.2 *Appliances fixed onto cartridges with female valve and threaded centre boss as defined in EN 417*
(see Figure 1)

5.7.2.2.1 The female thread of the adaptor (Figure 2) designed to be fixed onto the thread of the centre boss valve is defined as follows:

— 7/16 in - 28 threads Unified Form Special (see Figure 3).

— Major diameter : 10,96 mm minimum.

— Effective diameter : 10,66 – 10,75 mm;

— Minor diameter : 10,20 – 10,27 mm.

5.7.2.2.2 The part of the adaptor, with a full thread, shall be 3,10 mm $\pm$ 0,1 mm long (see Figure 2a).

5.7.2.2.3 The thread shall penetrate fully into the seal groove without reduction in form.

5.7.2.2.4 A valve actuator shall be fixed on the axis of the adaptor in such a way that it allows the drawing off of gas from a full cartridge in accordance with **5.7.1**. The valve actuator shall allow the release of gas from the cartridge when the appliance is screwed onto the valve with a minimum torque of 3 N·m.

5.7.2.2.5 The diameter of the valve actuator shall not exceed 2,20 mm if it is solid and shall be between 3,10 mm and 3,15 mm if it includes a gas way as indicated in Figure 2b. The valve actuator shall be concentric with the "7/16 in - 28 unified form thread" subject to a tolerance of 0,15 mm
(see Figures 2a and 2b).

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5.7.2.2.6 At the point where the valve actuator comes into contact with the valve seat, the valve actuator diameter shall be at least 1,70 mm (see Figure 2a).

NOTE It is recommended that adaptor manufacturers contact manufacturers of cartridge valves to establish the preferred design (see Figure 2b). The valve actuator shown in Figure 2b comes in contact with the inner seal of the valve ensuring complete soundness when the cartridge is fitted.

5.7.2.2.7 A seal groove shall be machined at the bottom of the threaded part so as to centre and secure a seal (see Figure 2a). This seal shall come into contact with the valve centre boss. The seal and the seal groove shall be such that there is no visible and permanent distortion of the threaded centre boss when the appliance is screwed onto the valve with a torque of 12 N·m.

5.7.2.2.8 The length of the valve actuator shall be such that it does not penetrate into the valve for a distance exceeding 4.15 mm below the plane of the upper side of the centre boss (see Figure 4, dimension *X*) when the appliance is screwed onto the valve with a torque of 12 N·m.

5.7.2.2.9 The inlet of the adaptor prior to the thread shall be a maximum of 2,00 mm deep and have a diameter of between 11,0 mm and 12,0 mm. In addition, the inlet of the adaptor shall begin with a 1,0 mm × 45° chamfer (see Figure 2a).

5.7.2.2.10 The diameter of the adaptor which penetrates the valve seal groove shall not exceed 22,90 mm. This part shall not extend more than 3,5 mm from the start of the adaptor thread (see Figure 2a).

5.7.2.2.11 The diameter of the adaptor beyond the 3,5 mm distance as defined in **5.7.2.2.10** shall be at least 30,0 mm. It shall be designed so as to rest on the rolled edge of the outer rim when fixing the appliance onto its cartridge, and after the seal ensuring soundness has come in contact with the cartridge valve. If the appliance incorporates other parts at this point (for example: blowlamp handles, plastic mouldings, etc), the requirements of **5.7.2.2.10** and **5.7.2.2.11** shall be met, when these parts are in position.

5.7.2.2.12 The requirements of **5.7.2.2** shall be verified under the test conditions given in **6.7.2.2**.

5.7.3 *Appliances connected to the gas container by a flexible hose*

Appliances connected to the gas container by a flexible hose shall be supplied with the flexible hose fitted.

If clips are used, they shall be of the machine formed type. Screw clips are not permitted.

Connections shall allow the flexible hose to move freely without risk of coming into contact with a part of the appliance whose temperature rise exceeds 70 K during the test defined in **6.21** when fitted in accordance with the instructions.

After the application of a load to the flexible hose under the conditions defined in **6.6.2,** no leak greater than 0,07 l/h (1 013 mbar, 20 °C) shall be recorded.

5.8 Transport, fixing and mobility devices

An appliance fitted with a device which, in accordance with the instructions, allows its transport and/or fixing (for example: handles) shall be capable of being carried and/or hung without causing permanent distortion of parts of the appliance. This requirement shall be verified under the test conditions defined in **6.8**.

Wheels allowing the movement of the appliance shall be sufficiently strong to support the appliance and, if necessary, its full container, if this is specified in the instructions.

If the appliance has wheels, means shall be provided to prevent accidental movement during use.

5.9 Taps

5.9.1 *General*

Each burner shall be controlled by a tap or device allowing the opening and closing of its supply. For appliances incorporating only one burner, this closing device may be that of the gas container.

Taps shall incorporate two stops, one on the closed position and one at the end of travel.

Taps shall be so placed in such a way that their strength, their operation, their manipulation and their accessibility undergo no change from actions to which they are subjected in normal use.

Taps shall be mounted in such a way that no accidental movement relative to fixed gas supply pipework is possible.

5.9.2 *Needle valves*

It shall not be possible to unscrew the needle from the housing of needle valves when opening the valve. When closing, the pressure of the needle on its seat constitutes the stop.

Needle valves shall comply with the requirements given in annex B.

5.10 Control handles

5.10.1 *Construction*

It shall be obvious which burner is controlled by each control handle.

They shall be so arranged relative to one another that the movement of one handle does not cause inadvertent movement of an adjacent one.

Control handles shall be so designed that they neither be fitted in the wrong position nor move by themselves.

If control handles operate by turning, the closing direction shall be clockwise.

5.10.2 *Marking*

5.10.2.1 *Taps with marked positions (for example: plug type taps)*

The closed, open and, if applicable, reduced rate positions shall be marked in a visible, legible and durable fashion.

The closed position shall be marked by a full disc or a circle at least 3 mm in diameter. It shall be the same for all the taps.

The identification of the closed position of each tap shall not give rise to any possibility of confusion with the identification of an open position.

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For other positions, the following symbols may be used :

— Full rate position	Large flame	
— Reduced rate position	Small flame	
— Rate range	Triangle	
	or	
	Scale	1 2 3 4
	or	4 3 2 1

Other symbols, other than letters, are permitted provided that they give similar information clearly.

Additional markings are permitted provided that they do not create confusion for the appliance user.

The meaning of the symbols used shall be given in the instructions.

5.10.2.2 *Taps with variable positions (for example : needle valves)*

Markings placed either on the appliance or on the control handles shall be visible, legible and durable and comply with the following requirements:

a) The closing direction shall be marked by an arrow (possibly stylized) whose tip points to a full disc or circle at least 3 mm in diameter or the mark "-" symbolizing the closing position, for example



b) Marking of the reduced rate is not required.

Additional markings are permitted provided that they do not create confusion for the appliances user.

c) The meaning of the symbols used shall be given in the instructions.

5.11 Injectors

The gas rate shall be controlled by a calibrated injector.

Removable injectors shall carry an indelible marking allowing their identification, which shall be given in the instructions.

5.12 Ignition devices

When an ignition device is fitted, it shall be designed and constructed in such a way that it provides rapid and safe ignition.

The components of the ignition device shall be designed to avoid damage and displacement during use. The relative positions of the ignition device and the burner shall be sufficiently well defined to ensure safe operation of the assembly.

5.13 Flame supervision devices

When the flame supervision device falls within the scope of EN 125, the requirements of that standard shall apply.

When flame supervision devices are fitted, they shall be designed in such a way that, in the case of the failure of any of the components indispensable to their performance, the supply of the gas to the burner and to the pilot controlled by the device is cut off automatically and can only be restored by manual operation. They shall be so mounted as to ensure satisfactory performance.

The appliance shall not incorporate any device that allows the flame supervision device to be overridden. During the ignition period, a brief passage of unlit gas is permitted under the conditions given in **6.13.**

Heating appliances, other than those supplied by cartridges (having a maximum capacity of 1 l), shall be fitted with a flame supervision device.

Under the test conditions described in **6.13**, the ignition delay time shall not exceed 20 s and the extinction delay time shall be less than 60 s.

5.14 Burners and radiant elements

Burners and radiant elements shall be designed in such a way that they cannot move inadvertently during use or movement of the appliance.

The parts of a burner or a radiant element which require cleaning shall be removable and their cleaning shall be easy unless this is possible without dismantling.

It shall not be possible to reassemble removable burner parts incorrectly and they shall not be interchangeable if, by design, they are not identical. This shall be carried out in accordance with the information given in the instructions.

It shall be possible to the user to check that the burners are alight.

Crosslighting devices shall have a fixed position relative to the burners that they control and shall not distort in normal use.

Under the test conditions defined in **6.6.3**, there shall be no leak of gas in a flammable quantity at the joints of the assembly.

— of burners made up of several parts;

— of burners on the body of the appliance.

5.15 Grids

5.15.1 *General*

Grids shall be detachable. When their height can be adjusted in accordance with the instructions while the burner is alight, they shall be provided with a fixed, moveable or detachable handle.

5.15.2 *Grid with a rigid useful area*

In the useful area of the grid, the bars, if any, shall not be more than 2 cm apart.

The grid shall be capable of withstanding, without deterioration likely to impair its use, the load described in **6.15**. Under this load, it shall remain stable on its supports.

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