BRITISH STANDARD

BS EN 1106:2010

Manually operated taps for gas burning appliances

ICS 23.060.40; 27.060.20

National foreword

This British Standard is the UK implementation of EN 1106:2010. It supersedes BS EN 1106:2001 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GSE/22, Safety and control devices for gas and oil burners and gas burning appliances.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

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EUROPÄISCHE NORM

EN 1106

May 2010

ICS 23.060.40

Supersedes EN 1106:2001

English Version

Manually operated taps for gas burning appliances

Robinets à commande manuelle pour appareils à gaz

Handbetätigte Einstellgeräte für Gasgeräte

This European Standard was approved by CEN on 29 April 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 1106:2010) has been prepared by Technical Committee CEN/TC 58 “Safety and control devices for burners and appliances burning gaseous or liquid fuels”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1106:2001.

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

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

This document is intended to be used in conjunction with EN 13611:2007. This document refers to clauses of EN 13611:2007 or adapts clauses by stating "with the following modification", "with the following addition", "is replaced with the following" or "is not applicable" in the corresponding clause. This European Standard adds clauses or subclauses to the structure of EN 13611:2007 which are particular to this standard. It should be noted that these clauses and subclauses are not indicated as an addition.

It should be noted that the following significant technical changes compared to the previous edition have been incorporated in this European Standard:

a) scope is enlarged to maximum inlet pressures up to and including 50 kPa (500 mbar);

b) alignment with EN 13611:2007;

c) updating of Clause 2, Normative references;

d) requirements from EN 126:2004 relating to "Open and closed position of a tap", "Compensation means for taps" and "Spring effect in taps" were included (refer to 6.101.9 to 6.101.11);

e) requirements and tests relating to durability of elastomers in contact with gas (7.8 of this standard) are now totally aligned with EN 13611:2007, 7.8.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies the safety, construction and performance requirements for manually operated taps and pre-setting taps intended for use with gas appliances and similar use, hereafter referred to as "taps".

This European Standard is applicable to taps with declared maximum inlet pressures up to and including 50 kPa (500 mbar) of nominal connection sizes up to and including DN 50 for use with one or more fuel gases in accordance with EN 437.

This European Standard does not apply to manual operated shut-off valves conforming to EN 331.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13611:2007, *Safety and control devices for gas burners and gas burning appliances — General requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2007 and the following apply.

3.101
control tap
direct or indirect manually operated devices with one or more outlets for the control of the flow of gas from an off to an on position and vice versa

NOTE Parts commonly used in taps are shown as examples in Figures 1 to 5.

Key

1 body
2 plug
3 latch pin
4 operating spindle
5 flats for handle
6 latch pin guide
7 spring for operating spindle
8 gas inlet
9 bearing seal
10 gas outlet
11 reduced flow rate gas inlet
12 reduced flow rate gas way
13 overlapping seal
14 sealing ring
15 restricting screw
16 sealing screw for pre-setting screw
17 pre-setting screw
18 tap
19 reduced flow rate screw

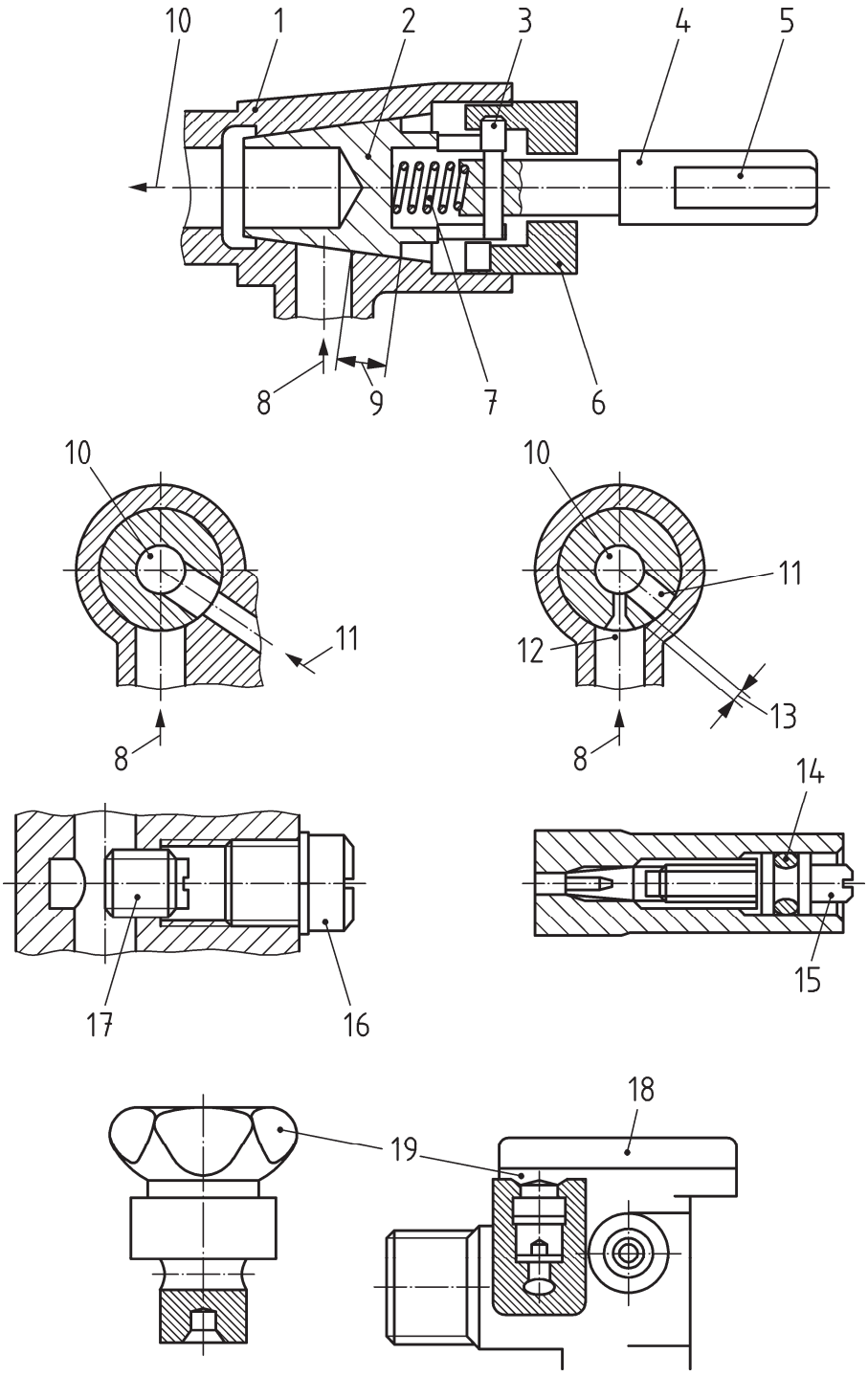
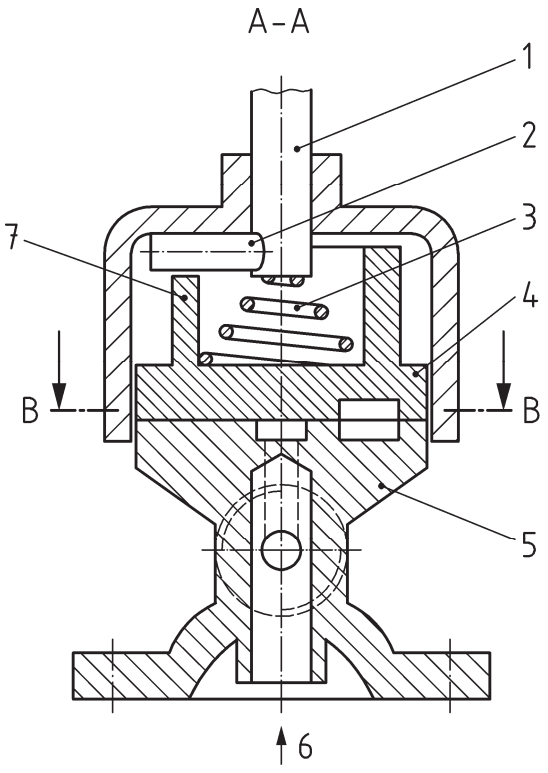


Figure 1 — Taper plug tap

Key

1 operating spindle
2 latch pin
3 spring for operating spindle
4 disc
5 body
6 gas inlet
7 latch pin guide
8 gas outlet



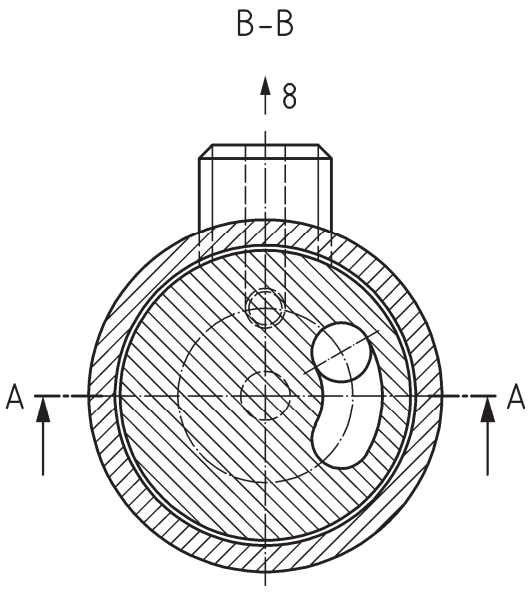


Figure 2 — Disc tap

Key

1 operating spindle
2 valve rod
3 spring for operating spindle
4 washer
5 spindle stop
6 tap body
7 gas inlet
8 disk spring
9 tap disk
10 O-ring seal
11 gas outlet

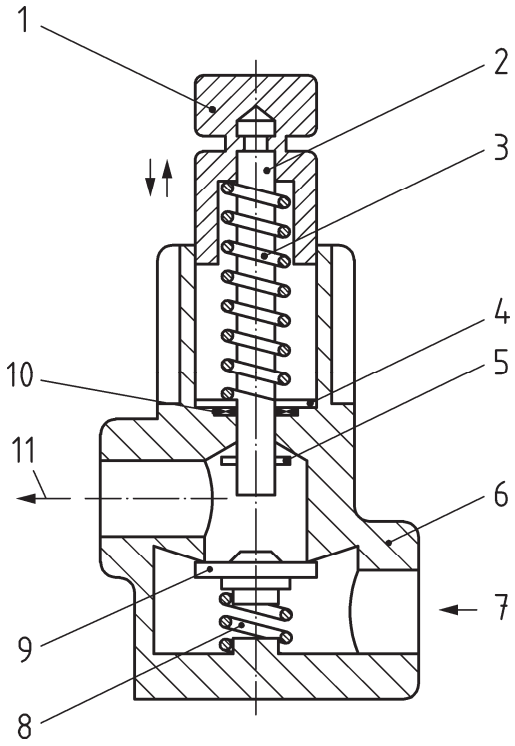


Figure 3 — Linear disc tap

Key

1 operating spindle
2 latch pin guide
3 adjustable stop
4 plug seal
5 body
6 plug
7 spring for operating spindle
8 latch pin
9 flat(s) for handle
10 gas outlet
11 main flow rate gas way
12 reduced flow rate gas way
13 gas inlet

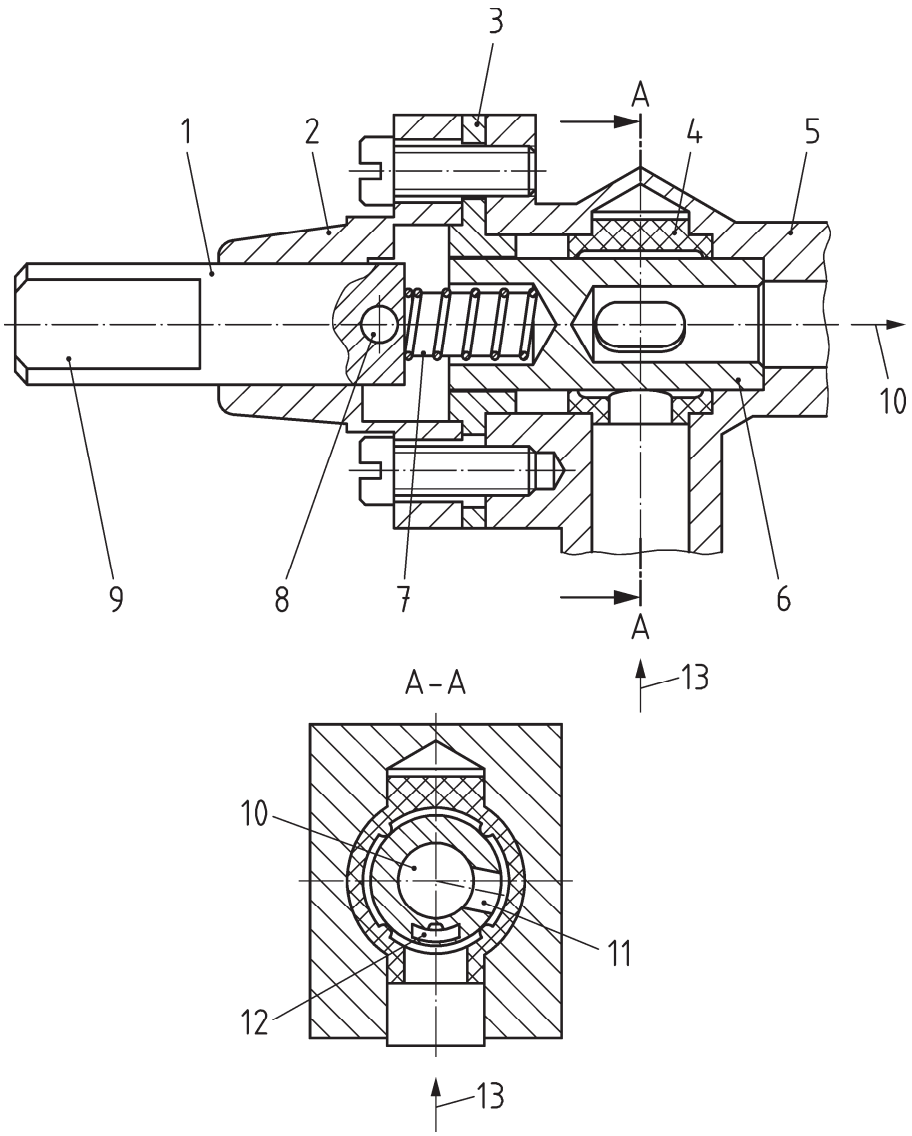


Figure 4 — Parallel plug tap

Key

1 latch pin
2 seal
3 body
4 needle
5 gas inlet
6 gas outlet

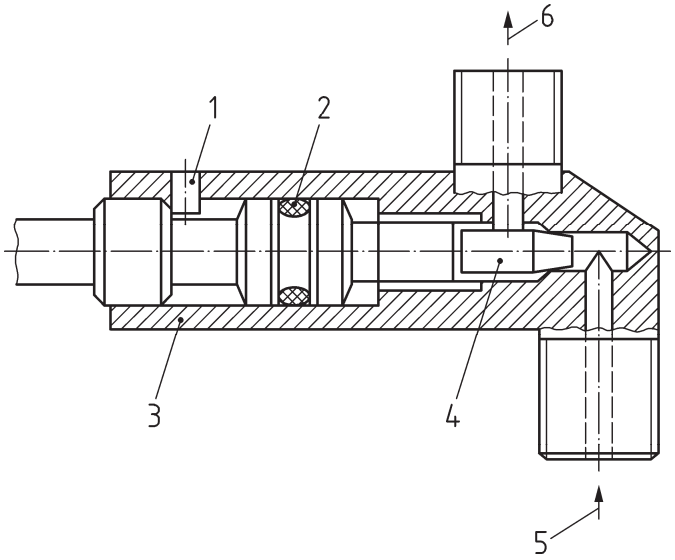


Figure 5 — Needle valve

3.102
tap closure member
part of the tap which releases, varies or shuts off the gas flow

3.103
gas rate pre-setting device
device for pre-setting the gas rate to a given value

NOTE The setting can be either discontinuous (by change of calibrated orifices) or continuous (by setting screw).

3.104
flow rate curve
curve which indicates the air flow in relation to the angle of opening

3.105
bearing seal
shortest distance between gas-carrying parts and the atmosphere measured along the length of the sealing surfaces

4 Classification

4.1 Classes of control

Shall be according to EN 13611:2007, 4.1 with the following addition:

Taps are classified according to the number of operations that may be expected of the tap during the life of the appliance:

— 5 000 operations (e.g. central heating boilers);

— 10 000 operations (e.g. space heaters);

— 40 000 operations (e.g. domestic hot plates).

4.2 Groups of taps

Shall be according to EN 13611:2007, 4.2.

4.3 Classes of control functions

EN 13611:2007, 4.3 is not applicable.

5 Units of measurement and test conditions

Shall be according to EN 13611:2007, Clause 5.

6 Construction requirements

6.1 General

Shall be according to EN 13611:2007, 6.1.

6.2 Mechanical parts of the control

6.2.1 Appearance

Shall be according to EN 13611:2007, 6.2.1.

6.2.2 Holes

Shall be according to EN 13611:2007, 6.2.2.

6.2.3 Breather holes

Shall be according to EN 13611:2007, 6.2.3.

6.2.4 Test for leakage of breather holes

Shall be according to EN 13611:2007, 6.2.4.

6.2.5 Screwed fastenings

Shall be according to EN 13611:2007, 6.2.5.

6.2.6 Jointing

Shall be according to EN 13611:2007, 6.2.6.

6.2.7 Moving parts

Shall be according to EN 13611:2007, 6.2.7.

6.2.8 Sealing caps

Shall be according to EN 13611:2007, 6.2.8.

6.2.9 Dismantling and reassembly

Shall be according to EN 13611:2007, 6.2.9.

6.2.101 Operating parts of taps

Taps operated by rotation shall be opened by turning the operating device anticlockwise and closed by turning it clockwise, except for taps which provide more than one burner with gas.

Taps shall be operated manually without the use of tools.

It shall not be possible in normal use to apply such forces to the closure member that it is lifted out of its seat or is brought into a position which causes the leakage rates to exceed the values given in 7.2.

It shall not be possible to exert direct axial pressure (other than spring pressure) on the closure member when the operating spindle is depressed to clear any knitting arrangement.

The taper plug at the large diameter shall be recessed into the body, and the plug shall protrude beyond the taper of the body at the small end. There shall be adequate clearance provided for this protrusion.

6.3 Materials

6.3.1 General material requirements

Shall be according to EN 13611:2007, 6.3.1.

6.3.2 Housing

EN 13611:2007, 6.3.2 is replaced with the following:

Parts of the housing that separate a gas-carrying compartment from the atmosphere shall be manufactured only of metallic materials.

O-rings, gaskets and other seals are allowed.

6.3.3 Test for leakage of housing after removal of non-metallic parts

EN 13611:2007, 6.3.3 is not applicable.

6.3.4 Zinc alloys

Shall be according to EN 13611:2007, 6.3.4.

6.3.5 Springs providing closing and/or sealing force

Shall be according to EN 13611:2007, 6.3.5.

6.3.6 Resistance to corrosion and surface protection

Shall be according to EN 13611:2007, 6.3.6.

6.3.7 Impregnation

Shall be according to EN 13611:2007, 6.3.7.

6.3.8 Seals for glands for moving parts

Shall be according to EN 13611:2007, 6.3.8.

6.3.101 Tap closure member

Gas-closing parts shall either have a metallic support to withstand the sealing force or shall be made of metal. This requirement also applies to parts transmitting the closing force.

For guide elements (see Figures 1 to 5) non-metallic materials are admissible.

6.4 Gas connections

Shall be according to EN 13611:2007, 6.4.

6.5 Electronic parts of the control

EN 13611:2007, 6.5 is not applicable.

6.6 Protection against internal faults for the purpose of functional safety

EN 13611:2007, 6.6 is not applicable.

6.101 Component parts

6.101.1 General

If markings are used for the different positions of the tap, the following symbols according to Table 1 shall be clearly and durably marked or markings shall be used according to the relevant appliance standards (e.g. EN 30-1-1 and EN 14543).

Table 1 — Marking

Position	Symbol
Off:	Plain disc
Ignition:	Star
Full on:	Large flame
Reduced flow:	Small flame

The off-position shall have a non-adjustable stop.

6.101.2 Turning angles

6.101.2.1 General

The marked reduced flow position, if any, shall be placed either after the fully open position or between the open and the closed position.

The turning angle of the needle valve between the closed and the fully open position shall be between 180° and 360°.

6.101.2.2 Opening at maximum flow

If the reduced flow rate position is placed after the fully open position the following requirements shall be met:

— in order to change from the closed position to the fully open position the turning angle shall be (90 ± 5)°;

— the turning angle between the fully open position and the reduced flow rate position shall be greater than 70°; this requirement is not applicable to multi-outlet taps;

— the movement of the tap closure member shall be limited by a fixed stop at the reduced flow rate position.

6.101.2.3 Opening at minimum flow

If the reduced flow rate position is placed between the closed and fully open position the following requirements shall be met:

— in order to change from the closed position to the fully open position the turning angle shall be greater than 90°;

— in order to change from the reduced flow rate position to the fully open position the turning angle shall be greater than 70°; this requirement is not applicable for multi-outlet-taps;

— a reduced flow rate position shall be provided by means of a part which locates the tap closure member in this position when the movement is in the direction of closing;

— the movement of the tap closure member shall be limited in the fully open position by a stop.

6.101.2.4 Single outlet tap

If a single outlet tap does not have a reduced flow position, the turning angle to pass from the closed position to the fully open position shall be (90 ± 5)°.

6.101.3 Lubrication

The tap shall be designed so that normal lubrication does not cause blockage of any gas way.

6.101.4 Stops

The extreme positions of the tap travel shall be limited by stops.

When operating needle valves it shall not be possible to remove the needle completely from the body by unscrewing. When closing the positive stop is obtained by contact of the needle on its seat.

6.101.5 Safety lock

Single outlet taps may be provided with a safety lock preventing any accidental opening which requires two separate actions to operate the tap.

Taps with two outlets for two separate burners shall be designed so that in order to change from one outlet to the other it is necessary to pass through a locked closed position. It shall only be possible for the user to change from one outlet to the other by a deliberate action. In particular it shall not be possible to change from one outlet to the other by keeping the handle constantly pressed in or by a pure turning movement.

6.101.6 Bearing seal

The bearing seal for taps except needle valves shall be ≥ 3 mm (see Figure 1).

6.101.7 Taper angle

For taper plug taps the closure member included angle shall be at least 9° 25'.

6.101.8 Pre-setting devices

If present, pre-setting devices shall be easily accessible and not be able to fall into the gas ways of the tap.

The operation of pre-setting devices shall only be possible with a commercially available type of screwdriver or spanner.

Pre-setting devices shall be fixed in their set positions.

6.101.9 Open and closed position of a tap

Marking of the open and closed position of a tap shall be used unless both the main burner and the ignition burner are supervised and the manually operated tap cannot be incorrectly operated and if the manual actuator, in the open and closed position is so arranged that any marking is not possible (e.g. push-button for on and off).

6.101.10 Compensation means for taps

Manually operated taps shall be designed with compensating means to take up automatically any wear between the closure member and the control body.

6.101.11 Spring effect in taps

The tapered plug shall be held in position in the body by a spring. The construction shall be such that any play between plug and tap body caused by wear which can be expected during normal life shall be taken up automatically.

7 Performance

7.1 General

Shall be according to EN 13611:2007, 7.1.

7.2 Leak-tightness

Shall be according to EN 13611:2007, 7.2.

7.3 Test for leak-tightness

Shall be according to EN 13611:2007, 7.3.

7.4 Torsion and bending

Shall be according to EN 13611:2007, 7.4.

7.5 Torsion and bending tests

Shall be according to EN 13611:2007, 7.5.

7.6 Rated flow rate

Shall be according to EN 13611:2007, 7.6 with the following addition:

The flow rate shall be measured at the fully open position and if applicable at the reduced flow rate position.

7.7 Test for rated flow rate

7.7.1 Apparatus

Shall be according to EN 13611:2007, 7.7.1.

7.7.2 Test procedure

Shall be according to EN 13611:2007, 7.7.2 with the following modification:

The test shall be performed at 100 Pa (1 mbar) pressure difference.

7.7.3 Conversion of air flow rate

Shall be according to EN 13611:2007, 7.7.3.

7.8 Durability

Shall be according to EN 13611:2007, 7.8.

7.9 Performance tests for electronic controls

EN 13611:2007, 7.9 is not applicable.

7.10 Long-term performance for electronic controls

EN 13611:2007, 7.10 is not applicable.

7.101 Operating torque and force

7.101.1 Requirements for operating torque

The operating torque shall not exceed the values given in Table 2 when tested in accordance with 7.101.2.

The operating torque of a tap knob shall not exceed 0,017 N·m per millimetre of the knob diameter.

NOTE If an additional device is also operated, e.g. a piezo igniter, then the torque to operate this additional device is excluded.

Table 2 — Maximum operating torque

Inlet nominal size DN	Operating torque N·m		
	5 000 operations	10 000 operations	40 000 operations
DN ≤ 12	0,6	0,4	0,2
12 < DN ≤ 25	0,6	0,6	0,4
25 < DN ≤ 50	1,0	0,6	0,4

7.101.2 Test for operating torque

The operating torque is measured with a suitable torque-meter having accuracy within ± 10 % of the maximum value of operating torque specified in Table 2 for the relevant size of the tap to check for conformity with 7.101.1. The opening and closing movements are carried out at a constant angular velocity of approximately 1,5 rad/s.

7.101.3 Requirements for operating force

For taps which are operated by a push-button, the force required for the manual operation of the push-button shall not exceed the values given in Table 3 when tested in accordance with 7.101.4.

Where an actuating knob is supplied the operating force shall not exceed 0,5 N.

Table 3 — Maximum operating force

Inlet nominal size DN	Operating force N		
	5 000 operations	10 000 operations	40 000 operations
< 10	45	45	30
10 ≤ DN ≤ 50	60	60	45

7.101.4 Test for operating force

The operating force is measured with a suitable dynamometer having accuracy within ± 10 % of the maximum value of operating force specified in Table 3 for the relevant size of the tap to check for conformity with 7.101.3.

7.101.5 Requirements for operating torque for safety lock

If the tap is designed to lock in the OFF position, it shall not unlock when a torque of 1 N·m is applied when tested in accordance with 7.101.6. The performance of the tap shall not be permanently impaired by this torque.

7.101.6 Test for operating torque for safety lock

In the off-position the safety lock is subjected ten times to an applied torque of 1 N·m for 10 s to check for conformity with 7.101.5.

7.102 Endurance

7.102.1 Requirement

The tap shall withstand the number of operations corresponding to the classification given in 4.1. This does not apply to pre-setting devices.

After endurance testing there shall be no visible damage or visible change to the marked positions. The leakage shall conform to the values specified in EN 13611:2007, Table 2. The force necessary for operation shall not exceed the values specified in 7.101.1 or 7.101.3.

7.102.2 Endurance test

7.102.2.1 Static endurance test

Two taps (one in the open position, the other in the closed position) are subjected successively to temperature resistance tests under the following conditions:

48 h at 0 °C or at the minimum operating temperature as stated in the operating instructions, whichever is the lower.

48 h at 60 °C or at the maximum operating temperature as stated in the operating instructions, whichever is the higher.

After this test without any preliminary operation of the tap the operating torque is checked.

7.102.2.2 Dynamic endurance test

Taps shall be tested according to the number of operations:

— 5 000 operations;

— 10 000 operations; or

— 40 000 operations

under the following conditions:

— 50 % of the operations shall be performed at the maximum operating temperature as stated in the operating instructions;

— 50 % of the operations shall be performed at a temperature of (20 ± 5) °C.

NOTE For accelerating the endurance test the operating method and the operating frequency (operations per minute) may be declared by the manufacturer. The operating torque/force should not be greater than 130 % of the value specified in 7.101.1 or 7.101.3.

8 EMC/Electrical requirements

EN 13611:2007, Clause 8 is not applicable.

9 Marking, installation and operating instructions

9.1 Marking

EN 13611:2007, 9.1 is replaced with the following:

The following information, at least, shall be durably marked on the tap in a clearly visible position:

a) manufacturer and/or his identification symbol;

b) type reference;

c) maximum inlet pressure in pascals or kilopascals (millibars or bars);

d) direction of gas flow (by a cast or embossed arrow);

e) date of manufacture (at least year) − may be in code.

In case of lack of space leave out information c) for taps with an operating pressure less than or equal to 10 kPa (100 mbar).

9.2 Installation and operating instructions

EN 13611:2007, 9.2 is replaced with the following:

Instructions shall include all relevant information on use, installation, operation and servicing, in particular:

a) number of tap operations;

b) group 1 (if applicable);

c) rated flow rate;

d) ambient temperature range;

e) mounting position(s);

f) inlet pressure range in pascals or kilopascals (millibars or bars);

g) gas connection(s);

h) safety lock tap (if applicable);

i) gas families for which the tap is suitable;

j) notice for installer to consider, e.g. condition for up-stream pressure (overpressure at the inlet in case of failure of upstream components), dirt, corrosion products.

9.3 Warning notice

Shall be according to EN 13611:2007, 9.3.

Annex A
(normative)

Gas connections in common use in the various countries

Shall be according to EN 13611:2007, Annex A.

Annex B
(informative)

Leak-tightness test − volumetric method

Shall be according to EN 13611:2007, Annex B.

Annex C
(informative)

Leak-tightness test − pressure loss method

Shall be according to EN 13611:2007, Annex C.

Annex D
(normative)

Conversion of pressure loss into leakage rate

Shall be according to EN 13611:2007, Annex D.

Annex E
(normative)

Electrical/electronic component fault modes

EN 13611:2007, Annex E is not applicable.

Annex F
(normative)

Additional requirements for safety accessories and pressure accessories as defined in EU Directive 97/23/EC

EN 13611:2007, Annex F is not applicable.

Annex G
(normative)

Materials for pressurized parts

EN 13611:2007, Annex G is not applicable.

Annex H
(informative)

Additional materials for pressurized parts

EN 13611:2007, Annex H is not applicable.

Annex I
(normative)

Requirements for controls used in DC supplied gas burners and gas burning appliances

EN 13611:2007, Annex I is not applicable.

Annex ZA
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2009/142/EC relating to appliances burning gaseous fuels

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2009/142/EC relating to appliances burning gaseous fuels.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Directive 2009/142/EC relating to appliances burning gaseous fuels

N/A = Not applicable

Essential Requirement (ERs) of Directive 2009/142/EC		Clause(s)/subclause(s) of this European Standard
1	**GENERAL CONDITIONS**	
1.1	Safety of operation	1, 6, 7
1.2	Instructions	9.2, 9.3
1.2.1	Installation instructions	9.2
1.2.2	User instructions	9.2
1.2.3	Warning notices	9.3
1.3	Correct operation	7, 9.2
2	**MATERIALS**	
2.1, 2.2	Suitability for safety and intended purpose	6.2, 6.3
3	**DESIGN AND CONSTRUCTION**	
3.1	General	
3.1.1	Mechanical stability	6.1, 6.2, 6.3, 6.4
3.1.2	Condensation	N/A
3.1.3	Risk of explosion	7.2, 7.3
3.1.4	Water penetration	N/A

Table ZA.1 *(continued)*

Essential Requirement (ERs) of Directive 2009/142/EC		Clause(s)/subclause(s) of this European Standard
3.1.5	Normal fluctuation of auxiliary energy	N/A
3.1.6	Abnormal fluctuation of auxiliary energy	N/A
3.1.7	Hazards of electrical origin	N/A
3.1.8	Pressurized parts	6.1
3.1.9	Failure of safety, controlling and regulating devices	7.101
3.1.10	Safety/adjustment	7.101
3.1.11	Protection of parts set by the manufacturer	6.2, 6.3
3.1.12	Controlling and setting devices	6.2, 7.101
3.2	Unburned gas release	
3.2.1	Gas leakage	6.2.3, 6.2.4, 6.3.2, 6.3.3, 7.2, 7.3
3.2.2, 3.2.3	Gas accumulation	N/A
3.3	Ignition	N/A
3.4	Combustion	N/A
3.5	Rational use of energy	N/A
3.6	Temperatures	N/A
3.7	Foodstuffs and water used for sanitary purposes	N/A

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Bibliography

Shall be according to EN 13611:2007, Bibliography, to which the following shall be added:

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

[111] EN 331, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

[112] EN 437, *Test gases — Test pressures — Appliance categories*

[113] EN 14543, *Specification for dedicated liquefied petroleum gas appliances — Parasol patio heaters — Flueless radiant heaters for outdoor or amply ventilated area use*

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