

SLOVENSKI STANDARD

SIST EN 88-1:2022

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Nadomešča:

SIST EN 88-1:2011+A1:2016

**Varnostne in nadzorne naprave za plinske gorilnike in plinske aparate - 1. del:
Regulatorji tlaka za vstopne tlake do vključno 50 kPa**

Safety and control devices for gas burners and gas burning appliances - Part 1: Pressure regulators for inlet pressures up to and including 50 kPa

Sicherheits- und Regeleinrichtungen für Gasbrenner und Gasgeräte - Teil 1: Druckregler für Eingangsdrücke bis einschließlich 50 kPa

Dispositifs de sécurité et de contrôle pour les brûleurs à gaz et appareils utilisant des combustibles gazeux - Partie 1 : Régulateurs de pression pour pression amont inférieure ou égale à 50 kPa

Ta slovenski standard je istoveten z: EN 88-1:2022

ICS:

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

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Supersedes EN 88-1:2011+A1:2016

English Version

**Safety and control devices for gas burners and gas burning
appliances - Part 1: Pressure regulators for inlet pressures
up to and including 50 kPa**

Dispositifs de sécurité et de contrôle pour les brûleurs
à gaz et appareils utilisant des combustibles gazeux -
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Sicherheits- und Regeleinrichtungen für Gasbrenner
und Gasgeräte - Teil 1: Druckregler für Eingangsdrücke
bis einschließlich 50 kPa

This European Standard was approved by CEN on 8 August 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 88-1:2022) 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of an identical text or by endorsement, at the latest by April 2023, and conflicting national standards shall be withdrawn at the latest by October 2025.

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

This document supersedes EN 88-1:2011+A1:2016.

The following significant changes compared to the previous edition have been incorporated in this document:

- a) title changed to be aligned with the title of CEN/TC 58;
- b) alignment with EN 13611:2019;
- c) requirements from EU Directive 2014/68/EU were not adopted;
- d) terms and definitions are aligned with EN 13611:2019;
- e) reference to EN 437 in the scope removed;
- f) EN 88-1, EN 88-2 and EN 88-3 aligned;
- g) 6.5.1 “Electronic parts of the control – General” is applicable;
- h) 7.2.101 and 7.2.102 “External leak-tightness for signal carrying compartment” separation between air and gas signal;
- i) information on life time for safe function (designed lifetime) added to instructions.

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

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

The EN 88 series consists of the following parts:

- EN 88-1, *Safety and control devices for gas burners and gas burning appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*;
- EN 88-2, *Safety and control devices for gas burners and gas burning appliances — Part 2: Pressure regulators for inlet pressures above 50 kPa up to and including 500 kPa*;
- EN 88-3, *Safety and control devices for gas burners and gas burning appliances — Part 3: Pressure and/or flow rate regulators for inlet pressures up to and including 500 kPa, electronic types*.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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Introduction

This document is intended to be used in conjunction with EN 13611:2019.

EN 13611:2019 recognizes the safety level specified by CEN/TC 58 and is regarded as a horizontal standard dealing with the safety, construction, performance and testing of controls for burners and appliances burning gaseous and/or liquid fuels.

The general requirements for controls are given in EN 13611:2019, and methods for classification and assessment for new controls and control functions are given in EN 14459:2021 (see Figure 1). EN 126:2012 (see Figure 1) specifies multifunctional controls combining two or more controls and Application Control Functions, one of which is a mechanical control function. The requirements for controls and Application Control Functions are given in the specific control standard (see Figure 1, control functions).

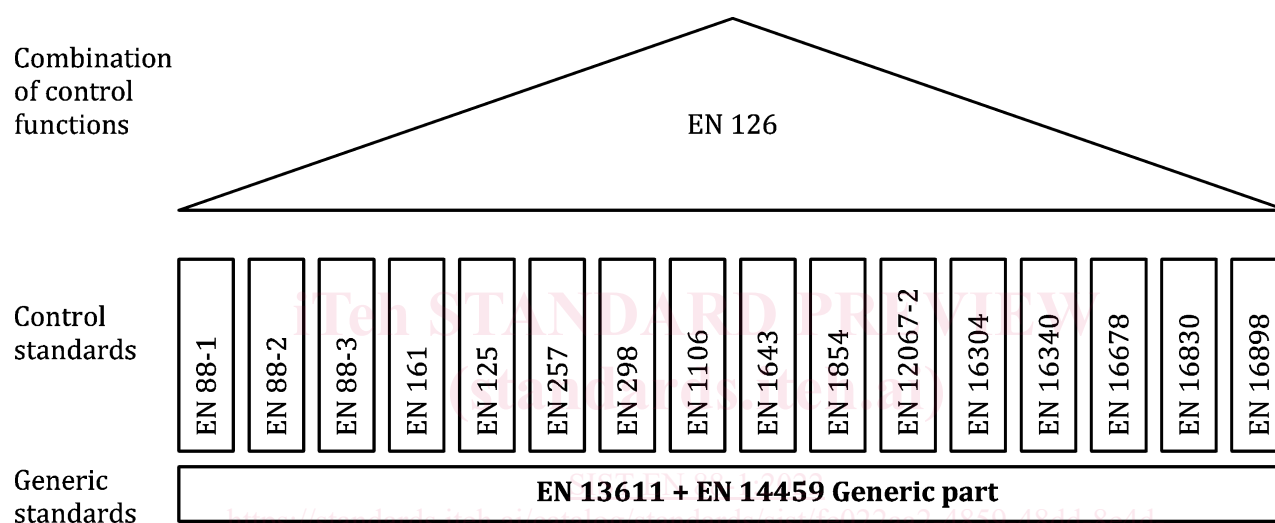


Figure 1 — Interrelation of control standards

EN 13611:2019 should be used in conjunction with the specific standard for a specific type of control (e.g. EN 88-1:2022, EN 88-2:2022, EN 88-3:2022, EN 125:2022, EN 126:2012, EN 161:2022, EN 257:2022, EN 298:2022, EN 1106:2022, EN 1643:2022, EN 1854:—¹, EN 12067-2:2022, EN 16304:2022, EN 16340:2014, EN 16678:2022 and EN 16898:2022), or for controls for specific applications.

EN 13611:2019 can also be applied, so far as reasonable, to controls not mentioned in a specific standard and to controls designed on new principles, in which case additional requirements can be necessary. EN 14459:2021 provides methods for classification and assessment of new control principles.

Primarily in industrial applications it is common practice to rate the safety of a plant based on values describing the likelihood of a dangerous failure. These values are being used to determine Safety Integrity Levels or Performance Levels when the system is being assessed in its entirety.

CEN/TC 58 standards for safety relevant controls do go beyond this approach, because for a certain life time for which the product is specified, designed and tested a dangerous failure is not allowed at all. Failure modes are described and assessed in greater detail.

¹ Under preparation. Stage at the time of publication: FprEN 1854:2022.

Measures to prevent from dangerous situations are defined. Field experience over many decades is reflected in the CEN/TC 58 standards. Requirements of EN 13611:2019 can be considered as proven in practice.

This document refers to clauses of EN 13611:2019 or adapts clauses by stating “with the following modification”, “with the following addition”, “is replaced by the following” or “is not applicable” in the corresponding clause.

This document adds clauses or subclauses to the structure of EN 13611:2019 which are particular to this document. Subclauses which are additional to those in EN 13611:2019 are numbered starting from 101. Additional Annexes are designated as Annex AA and Annex BB. It should be noted that these clauses, subclauses and Annexes are not indicated as an addition.

If by reference to EN 13611:2019 the term “control” is given, this term should be read as “pressure regulator”.

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EN 88-1:2022 (E)**1 Scope**

EN 13611:2019, Clause 1 applies with the following modification and addition:

Modification:

The 1st paragraph of EN 13611:2019, Clause 1 is replaced by:

This document specifies the safety, design, construction, and performance requirements and testing for pressure regulators and pneumatic gas/air ratio pressure regulators (zero pressure regulators are included as a special type of pneumatic gas/air ratio pressure regulators) for burners and appliances burning one or more gaseous fuels, hereafter referred to as “pressure regulators”.

This document is applicable to pressure regulators with declared maximum inlet pressures up to and including 50 kPa and of nominal connection sizes up to and including DN 250.

Addition:

This document is applicable to:

- pressure regulators which use auxiliary energy;
- pneumatic gas/air ratio pressure regulators, which function by controlling a gas outlet pressure in response to an air signal pressure, air signal differential pressure, and/or to a furnace pressure signal (zero pressure regulators are included as a special type of pneumatic gas/air ratio pressure regulators);
- pneumatic gas/air ratio pressure regulators, which change an air outlet pressure in response to a gas signal pressure or a gas signal differential pressure.

This document is not applicable to:

- pressure regulators connected directly to a gas distribution network or to a container that maintains a standard distribution pressure;
- pressure regulators intended for gas appliances to be installed in the open air and exposed to the environment;
- mechanically linked gas/air ratio controls;
- electronic gas/air ratio controls (EN 12067-2:2022).

The 4th paragraph of EN 13611:2019, Clause 1 is removed.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 161:2022, *Automatic shut-off valves for gas burners and gas appliances*

EN 437:2021, *Test gases — Test pressures — Appliance categories*

EN 13611:2019², *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 175301-803:2006, *Detail Specification: Rectangular connectors — Flat contacts, 0,8 mm thickness, locking screw not detachable*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13611:2019 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.101

pressure regulator

device which maintains the outlet pressure constant independent of the variations in inlet pressure and/or flow rate within defined limits

Note 1 to entry: Examples of typical pressure regulators are given in Annex AA.

3.102

direct regulator

pressure regulator where the spring or pressure signal acts directly on the working diaphragm

3.103

indirect regulator

pressure regulator where the spring or pressure signal acts directly on a regulator diaphragm that controls the working diaphragm or the control member with pneumatic, hydraulic or electric means

3.104

adjustable pressure regulator

pressure regulator provided with means for changing the outlet pressure setting

3.105

pneumatic gas/air ratio pressure regulator

pressure regulator, which supplies gas at specified pressure at its outlet in response to control pressure

² As impacted by EN 13611:2019/AC:2021.

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3.106**zero pressure regulator**

pressure regulator, which maintains the outlet pressure constant at atmospheric pressure

3.107**control member**

movable part of the pressure regulator which varies flow rate and/or outlet pressure directly

3.108**inlet pressure range**

difference between the maximum and minimum values of the inlet pressure, as stated in the instructions

3.109**maximum inlet pressure**

$p_{1\max}$

highest inlet pressure, as stated in the instructions, at which the pressure regulator can be operated

3.110**minimum inlet pressure**

$p_{1\min}$

lowest inlet pressure, as stated in the instructions, at which the pressure regulator can be operated

3.111**maximum outlet pressure**

$p_{2\max}$

upper limit of the outlet pressure, as stated in the instructions, at which the pressure regulator can be operated

3.112**minimum outlet pressure**

$p_{2\min}$

lower limit of the outlet pressure, as stated in the instructions, at which the pressure regulator can be operated

3.113**outlet pressure range**

difference between the maximum and minimum values of the outlet pressure, as stated in the instructions

3.114**inlet setting pressure**

p_{1s}

inlet pressure at which the pressure regulator is set for test purposes

3.115**outlet setting pressure**

p_{2s}

outlet pressure at which the pressure regulator is set for test purposes

3.116**maximum rated flow rate**

q_{\max}

upper limit of the rated air flow rate, corrected to standard conditions, as stated in the instructions

3.117**minimum rated flow rate** q_{\min}

lower limit of the rated air flow rate, corrected to standard conditions, as stated in the instructions

3.118**signal pressure** p_3

pressure, differential pressure or a combination of both applied to the regulator in order to provide the specified outlet pressure

3.119**signal pressure range**

range of signal pressure between the maximum and minimum values, as stated in the instructions

3.120**load determining pressure** p_4

underpressure as a result of an air flow, e.g. produced by a sucking fan, through a restriction

3.121**gas/air ratio**

slope of a straight line relationship between the outlet pressure p_2 and signal pressure p_3

3.122**working diaphragm**

flexible member which, under the influence of the forces arising from loading and pressure, operates the control member

3.123**diaphragm plate**

stiffening plate fitted to the diaphragm

3.124**lock-up pressure** p_{2f}

outlet pressure at which a pressure regulator closes when the outlet of the pressure regulator is sealed

3.125**put out of action**

block the operation of the pressure regulator by fixing the control member in the fully open position

3.126**furnace pressure**

pressure of combustion gases from the combustion chamber connected to the pressure regulator

3.127**signal chamber**

part of the pressure regulator to which the air signal pressure, gas pressure, or furnace pressure signal is connected

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3.128

signal connection

connection that is used to convey pressure from part of an installation to the signal chamber

3.129

offset

outlet pressure shift at pneumatic gas/air ratio pressure regulators independent of signal or load determining pressure(s)

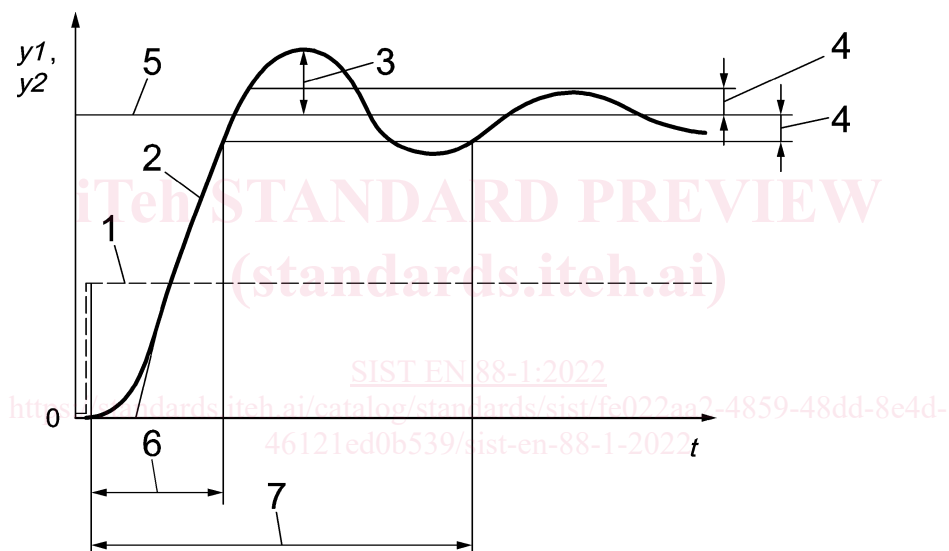
Note 1 to entry: Typically, this is achieved by means of a spring.

3.130

step response

outlet pressure change of a pneumatic gas/air ratio pressure regulator having a step change of the signal pressure or load determining pressure

Note 1 to entry: For further information refer to Figure 2.

**Key**

1	step function (y_1)	5	steady-state value
2	step response (y_2)	6	response time
3	overshoot value	7	settling time
4	settling tolerance	t	time

Figure 2 — Step response of a transfer element

3.131

steady state value

outlet pressure measured after step response remains constant

Note 1 to entry: For further information refer to Figure 2.

3.132

settling tolerance

maximum difference between the current outlet pressure and its steady state value

Note 1 to entry: For further information refer to Figure 2.

3.133**response time**

time counted from start of the step change of the signal pressure or load determining pressure until the outlet pressure is in the settling tolerance for the first time

Note 1 to entry: For further information refer to Figure 2.

3.134**settling time**

time counted from start of the step change of the signal pressure or load determining pressure until the outlet pressure remains within the settling tolerance

Note 1 to entry: For further information refer to Figure 2.

3.135**overshoot value**

largest difference between the outlet pressure and its steady state value after step change of the signal pressure or load determining pressure exceeding the settling tolerance for the first time

Note 1 to entry: For further information refer to Figure 2.

3.136**withstand pressure**

pressure that is withstood without degraded characteristic after returning below the maximum inlet pressure

Note 1 to entry: The withstand pressure is equal to or higher than the maximum inlet pressure.

[SOURCE: EN 1854:—¹, 3.115, modified – “at a PSD” removed from the definition and Note 1 to entry changed] <https://standards.iteh.ai/catalog/standards/sist/fe022aa2-4859-48dd-8e4d-46121ed0b539/sist-en-88-1-2022>

3.137**safety shut-off device**

SSD

device having the function of staying in the open position under normal operating conditions and to shut off the gas flow automatically and completely when the monitored pressure deviates above or below the pre-set value

[SOURCE: EN 88-2:2022, 3.103]

4 Classification**4.1 Classes of control**

EN 13611:2019, 4.1 is replaced by the following:

Pressure regulators shall be classified A, B, or C according to the appropriate outlet pressure and rated flow rate limits given in 7.101.1, Table 2.

Pneumatic gas/air ratio pressure regulators are not classified.

4.2 Groups of control

Shall be according to EN 13611:2019, 4.2.