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**Varnostne in nadzorne naprave za plinske gorilnike in plinske aparate - 3. del:  
Regulatorji tlaka in/ali regulatorji pretoka za vstopne tlake do vključno 500 kPa,  
elektronski tip**

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

Sicherheits- und Regeleinrichtungen für Gasbrenner und Gasbrennstoffgeräte - Teil 3: Druck- und/oder Durchflussregler für Eingangsdrücke bis einschließlich 500 kPa, elektronische Ausführung

Équipements auxiliaires pour brûleurs à gaz et appareils à gaz - Partie 3 - Régulateurs de pression et/ou de débit électroniques pour pression amont inférieure ou égale à 500 kPa Élément complémentaire

**Ta slovenski standard je istoveten z: prEN 88-3**

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**ICS:**

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

**oSIST prEN 88-3:2017****en,fr,de**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 88-3**

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## 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

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 58.

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If this draft becomes a European Standard, 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.

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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (prEN 88-3:2017) 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 document is currently submitted to the CEN Enquiry.

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 Regulation(s)/Directive(s).

For relationship with EU Regulation(s)/Directive(s), see informative Annexes ZA, ZB, or ZC, which are an integral part of this document.

This document is intended to be used in conjunction with EN 13611:2015. This document refers to clauses of EN 13611:2015 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 European Standard adds clauses or subclauses to the structure of EN 13611:2015 which are particular to this European Standard. It should be noted that these clauses and subclauses are not indicated as an addition. Subclauses or annexes which are additional to those in EN 13611:2015 are numbered starting from 101 or are designated as Annex AA, BB, CC, etc.

EN 88 *Pressure regulators and associated safety devices for gas appliances* consist of the following parts:

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

**prEN 88-3:2017 (E)****1 Scope**

This European Standard specifies the safety, design, construction, and performance requirements and testing for electronic pressure and/or flow rate regulators for burners and appliances burning one or more gaseous fuels, hereafter referred to as 'regulators'.

This European Standard is applicable to:

- regulators with declared maximum inlet pressures up to and including 500 kPa with nominal connection sizes up to and including DN 250;
- regulators which use auxiliary energy;
- regulators, which function by controlling a gas outlet pressure or a gas flow rate;
- regulators with a modular structure approved as a unit;
- regulators intended for gas appliances to be installed in the open air and exposed to the environment.

This European Standard does not cover:

- regulators connected directly to a gas distribution network or to a container that maintains a standard distribution pressure;
- electronic fuel/air ratio controls (see EN 12067-2).

NOTE EN 12067-2 is applicable to regulators being part of an electronic fuel/air ratio system.

**2 Normative references**

oSIST prEN 88-3:2017  
<https://standards.iteh.ai/catalog/standards/sist/fa70fa98-9214-4e9a-aa82-004ebbd54683/osist-pren-88-3-2017>

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 161:2011+A3:2013, *Automatic shut-off valves for gas burners and gas appliances*

EN 13611:2015, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 60529:1991, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60529:1991/A1:2000, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60529:1991/A2:2013, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

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

EN 1854:2010, *Pressure sensing devices for gas burners and gas burning appliances*

**3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 13611:2015 and the following apply.



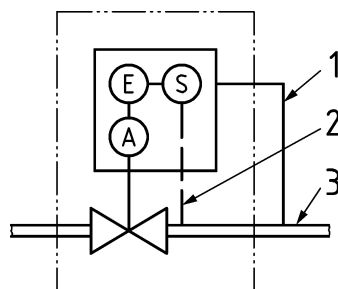
**3.101****pressure regulator**

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

**3.102****flow rate regulator**

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

Note 1 to entry: Examples are shown in Figure 1 and Figure 2.

**Key**

1 rigid pipe

2 internal impulse line

3 gas line

E Electronic

S Sensing element

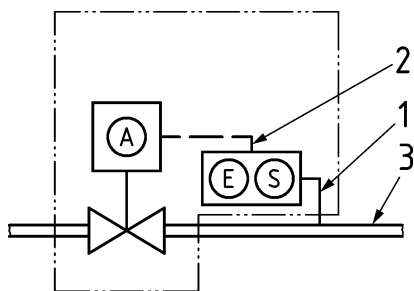
A Actuator

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**Figure 1 — Illustration of the components of a pressure and/or flow rate regulator**

**Key**

- 1 rigid pipe
- 2 wire
- 3 gas line
- E Electronic
- S Sensing element
- A Actuator

**Figure 2 — Illustration of the components of a pressure and/or flow rate regulator**

**3.103****adjustable regulator**

regulator provided with means for changing the outlet pressure or flow rate set point

**3.104****control member**

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

**3.105****minimum inlet pressure**

$p_{umin}$

lower limit of the inlet pressure, as stated in the installation and operating instructions

**3.106****maximum outlet pressure**

$p_{umax}$

upper limit of the inlet pressure, as stated in the installation and operating instructions

**3.107****inlet pressure range**

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

**3.108****minimum outlet pressure**

$p_{dmin}$

lower limit of the outlet pressure, as stated in the installation and operating instructions

**3.109****maximum outlet pressure**

$p_{dmax}$

upper limit of the outlet pressure, as stated in the installation and operating instructions

**3.110****outlet pressure range**

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

**3.111****outlet pressure set-point**

$p_{ds}$

outlet pressure to which the regulator is set

Note 1 to entry:  $p_{ds}$  can be an electrical signal which is equivalent to a desired set pressure

**3.112****minimum rated flow rate**

$q_{min}$

lower limit of the rated flow rate, as stated in the installation and operating instructions

**3.113****maximum rated flow rate**

$q_{max}$

upper limit of the rated flow rate, as stated in the installation and operating instructions

**3.114****rated flow rate range**

difference between the maximum and minimum values of the rated flow rate, as stated in the installation and operating instructions

**3.115****rated flow rate set-point**

$q_s$

rated flow rate to which the regulator is set

Note 1 to entry:  $q_s$  can be an electrical signal which is equivalent to a desired set flow rate.

**3.116****furnace pressure**

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

**3.117****signal connection**

connection that is used to convey pressure or flow from part of an installation to the EPS

**3.118****step response**

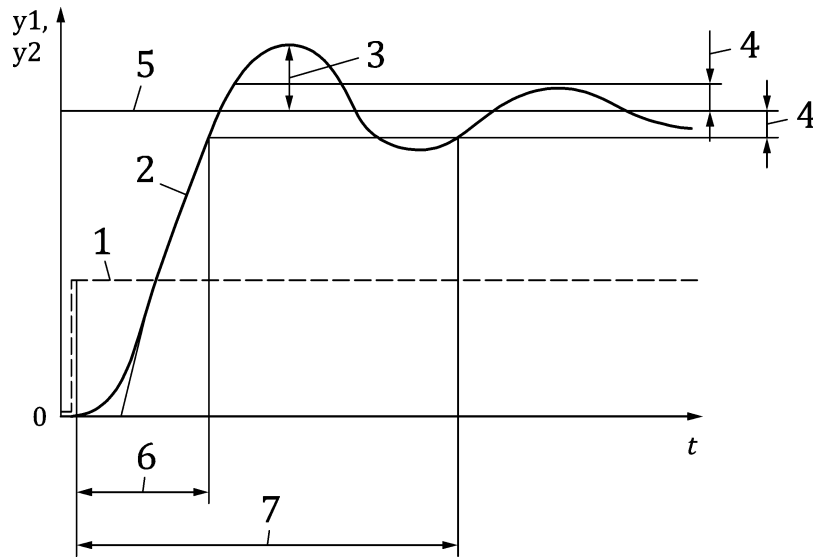
outlet pressure or flow rate change of the regulator having a step change of the outlet pressure or flow rate set-point signal (e.g. voltage)

Note 1 to entry: For further information refer to Figure 3.

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**Key**

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

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Figure 1 — Step response of a transfer element  
004ebbd54683/osist-pren-88-3-2017

**3.119****steady state value**

outlet pressure or flow rate measured after step response (outlet pressure or flow rate set-point signal remains constant)

**3.120****settling tolerance**

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

**3.121****response time**

time counted from start of the step change of the outlet pressure or flow rate set-point signal (e.g. voltage) until the outlet pressure or flow rate is within the settling tolerance for the first time

**3.122****settling time**

time counted from start of the step change of the outlet pressure or flow rate set-point signal until the outlet pressure or flow rate remains within the settling tolerance

**3.123****overshoot value**

largest difference between the outlet pressure or flow rate and its steady state value after step change of the outlet pressure or flow rate set-point signal exceeding the setting tolerance for the first time

**3.124****withstand pressure**

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

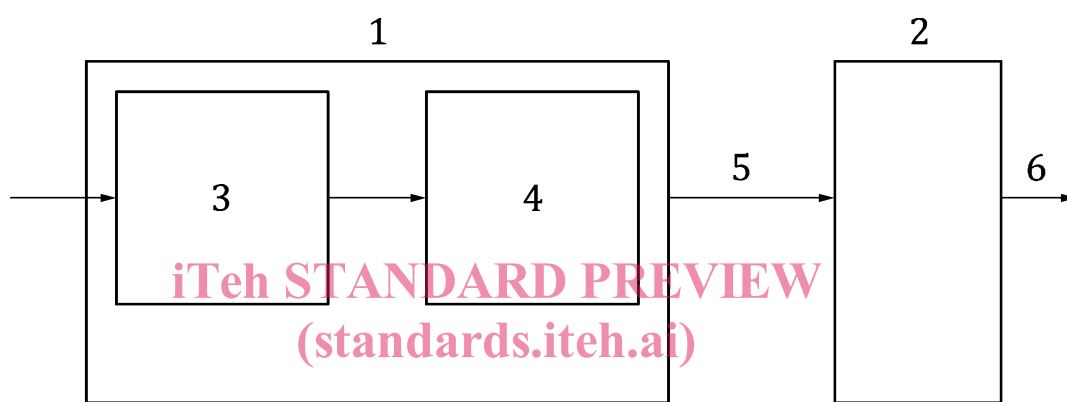
[EN 1854:2010, 3.116]

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

**3.125****electronic pressure or flow rate sensor****EPS**

assembly of electronic based pressure or flow rate sensing element and signal conditioner

Note 1 to entry: Figure 4, clarifies the EPS.



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**Key**

- 1 EPS
- 2 central unit
- 3 electronic pressure or flow rate sensing element
- 4 signal conditioner
- 5 interface
- 6 output pressure or flow rate signal

**Figure 4 — EPS**

**3.126****electronic pressure or flow rate sensing element**

part of the EPS, which transforms the signal to be sensed (e.g. pressure or flow rate) to another physical value (e.g. force, voltage)

**3.127****signal conditioner**

transforms the signal from the sensing element into the output signal of the EPS

**3.128****reposition**

movement of the control member in any direction from one position to the next and back

**prEN 88-3:2017 (E)****4 Classification****4.1 Classes of control**

EN 13611:2015, 4.1 is replaced by the following:

Regulators are not classified.

**4.2 Groups of control**

Shall be according to EN 13611:2015, 4.2.

**4.3 Classes of control functions**

Shall be according to EN 13611:2015, 4.3.

**4.4 Types of DC supplied controls**

Shall be according to EN 13611:2015, 4.4.

**5 Test conditions and uncertainty of measurements**

Shall be according to EN 13611:2015, Clause 5.

**6 Design and construction****6.1 General**

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Shall be according to EN 13611:2015, 6.1 with the following addition:

The overall functional safety of the regulator shall be according to the functional safety class B.

The withstand pressure shall be stated in the installation and operating instructions. If no withstand pressure is stated, the withstand pressure is equal to the maximum inlet pressure.

Regulators intended for gas appliances to be installed in the open air and exposed to the environment shall be suitably protected to prevent malfunction according to e.g. (non-exhaustive list):

- blocking of breather holes by icing or water;
- requirements for IP codes (EN 60529:1991 + EN 60529:1991/A1:2000 + EN 60529:1991/A2:2013);
- requirements for aging according to UV radiation.

Protection can also be achieved by the appliance or by additional measures, which shall be stated in the installation and operating instructions.

**6.2 Mechanical parts of the control****6.2.1 Appearance**

Shall be according to EN 13611:2015, 6.2.1.

**6.2.2 Holes**

Shall be according to EN 13611:2015, 6.2.2 with the following modification:

This requirement only applies to gas-carrying compartments.

### 6.2.3 Breather holes

#### 6.2.3.1 Requirements

Shall be according to EN 13611:2015, 6.2.3.1 with the following modification and addition:

Use the withstand pressure instead of the maximum inlet pressure.

Alternatively, for a withstand pressure up to and including 50 kPa, the requirement of a maximum leakage rate of 70 dm<sup>3</sup>/h for breather holes can be replaced by the following requirement:

- a ruptured electronic pressure sensing element shall lead to a safe situation (see 7.102);
- stress the electronic pressure sensing element with the temperature and pressure stress test of 6.2.3.2;
- after the tests of 6.2.3.2 the leakage rate shall fulfil the requirements of 7.2.

#### 6.2.3.2 Test for leakage of breather holes

Shall be according to EN 13611:2015, 6.2.3.2 with the following addition:

If the alternative requirement of 6.2.3.1 is used, the following test applies:

- leave the electronic pressure sensing element as is;
- store one electronic pressure sensing element for 1 h ± 5 min at 135 °C ± 2 °C ambient temperature;
- keep the electronic pressure sensing element at this temperature and apply a pressure of three times the withstand pressure to gas-carrying compartments for 5 min ± 10 s;
- wait for the electronic pressure sensing element to return to room temperature;
- measure the external leakage rate according to 7.2.2.

#### 6.2.4 Screwed fastenings

Shall be according to EN 13611:2015, 6.2.4 with the following modification:

This requirement applies only to gas-carrying compartments.

#### 6.2.5 Jointing

Shall be according to EN 13611:2015, 6.2.5 with the following modification:

This requirement applies only to gas-carrying compartments.

#### 6.2.6 Moving parts

Shall be according to EN 13611:2015, 6.2.6.

#### 6.2.7 Sealing caps

Shall be according to EN 13611:2015, 6.2.7.

#### 6.2.8 Dismantling and reassembly

Shall be according to EN 13611:2015, 6.2.8.