SLOVENSKI STANDARD
oSIST prEN 88-2:2015

01-februar-2015

Varnostne in nadzorne naprave za plinske gorilnike in plinske aparate - 2. del: Tlačni regulatorji za vstopne tlake nad 50 kPa do vključno 500 kPa in pripadajoče varnostne naprave

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 and associated safety devices

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Sicherheits- und Regeleinrichtungen für Gasbrenner und Gasgeräte - Teil 2: Druckregler für Eingangsdrücke über 50 kPa bis einschließlich 500 kPa und dazugehörigen Sicherheitseinrichtungen

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Dispositifs de sécurité et de contrôle pour les brûleurs à gaz et appareils utilisant des combustibles gazeux - Partie 2: Régulateurs de pression pour pressions amont comprises entre 50 kPa et 500 kPa et dispositifs de sécurité associés

Ta slovenski standard je istoveten z: **prEN 88-2 rev**

ICS:

23.060.40	Tlačni regulatorji	Pressure regulators

oSIST prEN 88-2:2015 **en,fr,de**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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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 and associated safety devices

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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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Foreword

This document (prEN 88-2:2014) 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 will supersede EN 88-2:2007.

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 and ZB, which is an integral part of this document.

For this European Standard a transition period of 3 years is proposed.

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

a) scope enlarged to “Pressure regulators incorporating safety devices";

b) alignment with prEN 13611:2012;

c) requirements and tests added for pressure regulators which use auxiliary energy;

d) classifications according to accuracy, lock-up, and overpressure shut-off added;

e) clause 6 enlarged to “Design and construction”;

f) clause 6.2.104 “Integral safety shut-off device” added;

g) clause 6.2.105 “Resistance to pressure” added;

h) clause 6.2.107 “Creep relief device” added;

i) clause 7.3 “Test for leak-tightness”, new value for test pressure;

j) design of all Figures adapted to design of Figures in EN 13611;

k) annex BB “Overview of requirement and test conditions” added;

l) annex CC “Creep relief device” added;

m) annex DD “Comparison between EN 334:2012 and EN 88-2:2013” added.

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EN 88 consists of the following parts, under the general title *Pressure regulators and associated safety devices for gas appliances*:

— *Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

— *Part 2: Pressure regulators for inlet pressure above 50 kPa up to and including 500 kPa and associated safety devices*

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Performance Level (PL) or Safety Integrity Level (SIL) classifications according to EN ISO 13849-1 or EN 61508-1 cannot automatically be claimed based upon compliance with this European Standard. Pressure regulators with SIL classification do not meet automatically the requirements of this standard.

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Introduction

This standard is a particular standard for Pressure Regulators for gas-burners and gas-burning appliances which cites the generic requirements of prEN 13611:2012 wherever possible. This standard supplements or modifies the corresponding clauses of prEN 13611:2012. The construction and performance requirements are as far as applicable in total conformity with prEN 13611:2012.

This document is intended to be used in conjunction with prEN 13611:2012. This document refers to clauses of prEN 13611:2012 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 sub-clauses to the structure of prEN 13611:2012 which are particular to this European Standard. It should be noted that these clauses and sub-clauses are not indicated as an addition. Subclauses or annexes which are additional to those in prEN 13611:2012 are numbered starting from 101 or are designed as Annex AA, BB, CC, etc..

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1 Scope

This European Standard specifies the safety, construction and performance requirements for pneumatic pressure regulators and safety devices, intended for use with gas burners, gas appliances and similar use, hereafter referred to as 'pressure regulators'.

This European Standard is applicable to:

— pressure regulators with declared maximum inlet pressure above 50 kPa up to and including 500 kPa, of nominal connection size up to and including DN 250 for use with one or more fuel gases in accordance with EN 437,

— pressure regulators incorporating safety devices,

— pressure regulators incorporating safety devices specified as safety accessories,

NOTE For safety accessories and pressure accessories, the requirements of prEN 13611:2012, Annex F also apply.

— pressure regulators which use auxiliary energy,

Pressure regulators intended to be used on pipe work installations for third family gases are also covered by EN 13785 and EN 13786.

This European Standard is not applicable to:

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— pressure regulators that are connected directly to mains pipe-work 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,

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— safety devices which use auxiliary energy.

2 Normative references

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

EN 88-1:2011, *Pressure regulators and associated safety devices for gas appliances — Part 1: Pressure regulators for inlet pressures up to and including 50 kPa*

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

EN 682, *Elastomeric seals — Materials requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids*

EN 12267:1999, *Industrial valves — Butt welding ends for steel valves*

prEN 13611:2012, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 13785+A1:2008, *Regulators with a capacity of up to and including 100 kg/h, having a maximum nominal outlet pressure of up to and including 4 bar, other than those covered by EN 12864 and their associated safety devices for butane, propane or their mixtures*

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EN 13786:2010, *Automatic change-over valves having a maximum outlet pressure of up to and including 4 bar with a capacity of up to and including 100 kg/h, and their associated safety devices for butane, propane or their mixtures*

EN 13787, *Elastomers for gas pressure regulators and associated safety devices for inlet pressures up to 100 bar*

EN 13906-1:2002, *Cylindrical helical springs made from round wire and bar — Calculation and design — Part 1: Compression springs*

EN 13906-2:2001, *Cylindrical helical springs made from round wire and bar — Calculation and design — Part 2: Extension springs*

EN 60534-2-3, *Industrial-process control valves — Part 2-3: Flow capacity — Test procedures (IEC 60534-2-3:1997)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 13611:2012 and the following apply.

3.101
pressure regulator
device that maintains the outlet pressure constant independent of the variations in inlet pressure and/or flow rate within defined limits

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[SOURCE: EN 88-1:2011, 3.101]

3.102
control member
movable part of the pressure regulator which varies flow rate and/or outlet pressure directly

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[SOURCE: EN 88-1:2011, 3.107]

3.103
safety shut-off device
SSD
device whose function is to stay 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

3.104
housing
part of the pressure regulator and/or SSD that is the main pressure containing envelope

3.105
valve seat
corresponding sealing surfaces within a pressure regulator or SSD that make full contact only when the pressure regulator or SSD is in the closed position

3.106
controller
device which normally includes a setting element, normally a spring, to obtain a set value of the outlet pressure and a pressure detector element, normally a diaphragm for the outlet pressure

3.107
actuator
device or mechanism which changes the signal from the controller into a corresponding movement controlling the position of the control member

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3.108
working diaphragm
flexible member which, under the influence of the forces arising from loading and pressure, operates the control member

Note 1 to entry: Diaphragms used as control member are not covered by this definition.

3.109
pressure containing parts
parts where failure would result in release of gas to the atmosphere

Note 1 to entry: Such parts comprise housings, inner partition walls, control member, bonnets, the housing of the actuator, blind flanges and pipes for process and sensing lines.

3.110
signal connection
part that is used to convey pressure from part of an installation to the signal chamber

3.111
breather line
line between the controller and/or pilot regulator and atmosphere which equalizes the pressure on a detector element when it changes its position

3.112
fixtures
functional devices connected to the main components of the pressure regulator or SSD

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3.113
exhaust line
line to atmosphere between the regulator or fixtures for the safe venting of gas in the event of a component failure

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3.114
trip mechanism
mechanism that releases the closure member when activated by the controller

3.115
SSD-actuator
device that is activated by the trip mechanism which shuts the closure member

3.116
relatching device
device that enables the complete opening of an SSD

3.117
motorization chamber
chamber at the higher pressure of two chambers under pressure within the housing of actuator

3.118
monitored pressure
pressure monitored and safeguarded by the SSD

3.119
trip pressure
pressure value at which the closing member starts to move

3.120
upper trip pressure p_{do}
upper limit of the monitored pressure (over-pressure)

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3.121
lower trip pressure
p_u
lower limit of the monitored pressure (under pressure)

3.122
outlet setting pressure
p_{2s}
outlet pressure at which the pressure regulator is set for test purposes

[SOURCE: EN 88-1:2011, 3.113]

3.123
maximum outlet pressure
p_{2max}
upper limit of the outlet pressure, as stated in the installation and operating instructions

[SOURCE: EN 88-1:2011, 3.109]

3.124
minimum outlet pressure
p_{2min}
lower limit of the outlet pressure, as stated in the installation and operating instructions

[SOURCE: EN 88-1:2011, 3.110]

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3.125
outlet pressure range
difference between minimum and maximum values of the outlet pressure

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[SOURCE: EN 88-1:2011, 3.111]

3.126
steady state value
outlet pressure measured after step response (control signal remains constant)

[SOURCE: EN 88-1:2011, 3.127]

3.127
settling tolerance
maximum difference between the current outlet pressure and its steady state value

[SOURCE: EN 88-1:2011, 3.128]

3.128
regulation tolerance
settling tolerance, expressed as a percentage of the outlet setting pressure

3.129
performance curve
graphic representation of the outlet pressure as a function of the rated flow rate

Note 1 to entry: This curve is determined by increasing and then decreasing the rated flow rate with constant inlet pressure and constant outlet setting pressure (see Figure BB.1).

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3.130
family of performance curves
set of the performance curves for each value of inlet pressure determined for a given outlet setting pressure

Note 1 to entry: See Figure BB.2.

3.131
accuracy
percentage of the outlet pressure relative to the outlet setting pressure within the operation range

3.132
accuracy class
AC
maximum permissible value of the accuracy

3.133
inlet pressure range
difference between the minimum and maximum values of the inlet pressure

[SOURCE: EN 88-1:2011, 3.108]

3.134
lock-up time
t_f
time taken for the control member to move from an open position to the closed position

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3.135
lock-up pressure
p_{2f}
outlet pressure at which a pressure regulator closes when the outlet of the pressure regulator is sealed

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[SOURCE: EN 88-1:2011, 3.120]

3.136
lock-up pressure class
SG
maximum permissible positive difference between the actual lock-up pressure(s) p_{2f} and the corresponding outlet setting pressure(s) at a certain percentage of the maximum rated flow rate q_{max} expressed as a percentage of the outlet setting pressure

Note 1 to entry: The lock-pressure pressure class, SG, is given by the following equation:

$$SG = 100 \cdot \frac{\left(p_{2f} - p_2\right)}{p_2} \qquad [1]$$

where

SG is the lock-up pressure class;

p_{2f} is the lock-up pressure; and

p_2 is the outlet setting pressure.

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3.137
maximum allowable pressure
PS
maximum pressure for which the pressure regulator and/or SSD is designed as stated in the installation and operating instructions

Note 1 to entry: In accordance with the strength requirements of this European Standard.

3.138
limit pressure
p_l
pressure at which yielding becomes apparent in any component of the pressure regulator or its fixtures

3.139
safety factor
S_b, S
ratio of the value of the limit pressure p_l to the value of the maximum allowable pressure PS

Note 1 to entry: This term applies to two separate discrete regions of the pressure regulator:

— applied to the pressure regulator housing: S_b;

— applied to the other pressure containing parts of the pressure regulator: S

4 Classification

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4.1 Classes of control

prEN 13611:2012, 4.1 is replaced by the following:

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Pressure regulators shall be classified according to regulator accuracy (7.101.2.4) AC 1, AC 2,5, AC 5, AC 10, and AC 20, according to lock-up pressure (7.101.2.5) SG 5, SG 10, SG 20, and SG 30, and according to overpressure shut-off accuracy (7.102.1) AG 5, AG 10, AG 20, and AG 30.

4.2 Groups of control

Shall be according to prEN 13611:2012, 4.2 with the following addition:

Pressure regulators shall fulfil Group 2 classification.

4.3 Classes of control function

prEN 13611:2012, 4.3 is not applicable.

4.4 Types of DC supplied controls

prEN 13611:2012, 4.4 is not applicable.

5 Units of measurement and test conditions

Shall be according to prEN 13611:2012, Clause 5.

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6 Design and construction

6.1 General

Shall be according to prEN 13611:2012, 6.1 with the following addition:

If in the event of a failure (e.g. of a diaphragm) leakage is possible, a tapping connection of at least DN 8 for an exhaust line shall be provided.

6.2 Mechanical parts of the control

6.2.1 Appearance

Shall be according to prEN 13611:2012, 6.2.1.

6.2.2 Holes

Shall be according to prEN 13611:2012, 6.2.2.

6.2.3 Breather holes

Shall be according to prEN 13611:2012, 6.2.3 with the following addition:

If the vented capacity is greater than 70 dm^3/h of air, a connection for a vent pipe shall be provided.

6.2.4 Test for leakage of breather holes

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Shall be according to prEN 13611:2012, 6.2.4.

6.2.5 Screwed fastenings

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Shall be according to prEN 13611:2012, 6.2.5.

6.2.6 Jointing

Shall be according to prEN 13611:2012, 6.2.6.

6.2.7 Moving parts

Shall be according to prEN 13611:2012, 6.2.7.

6.2.8 Sealing caps

Shall be according to prEN 13611:2012, 6.2.8.

6.2.9 Dismantling and reassembly

Shall be according to prEN 13611:2012, 6.2.9.

6.2.10 Auxiliary canals and orifices

Shall be according to prEN 13611:2012, 6.2.10.

6.2.11 Presetting device

Shall be according to prEN 13611:2012, 6.2.11.