SLOVENSKI STANDARD
oSIST prEN 1854:2020

01-oktober-2020

Varnostne in nadzorne naprave za gorilnike in aparate na plin in/ali tekoča goriva - Tlačna zaznavala za plinske gorilnike in plinske aparate

Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - Pressure sensing devices for gas burners and gas burning appliances

Ta slovenski standard je istoveten z: prEN 1854

ICS:

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

oSIST prEN 1854:2020 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 1854

August 2020

ICS 23.060.40

Will supersede EN 1854:2010

English Version

Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - Pressure sensing devices for gas burners and gas burning appliances

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

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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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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

Ref. No. prEN 1854:2020 E

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European foreword

This document (prEN 1854:2020) 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 1854:2010.

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 ZB, which are an integral part of this document.

This document refers to clauses of EN 13611:2019 or adapts it 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. 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 revised document:

a) the scope introduces a new declaration concerning the maximum inlet pressure covered by the revised standard;

b) incorporation of the requirements and tests for electronic pressure sensing devices (EPSDs);

c) alignment with EN 13611:2019

d) updating of definitions and normative references.

1 Scope

EN 13611:2019 is replaced by the following:

This document specifies the safety, design, construction, and performance requirements and testing of pressure sensing devices for burners and appliances burning one or more gaseous fuels.

It applies to pressure sensing devices for the measurement of pressures of gases according to EN 437 or air or combustion products for maximum inlet pressures up to 500 kPa (5 bar).

It applies to all types of pressure sensing devices, including electronic, differential and inferential types.

It also specifies requirements for pressure sensing devices which are intended to be applied to steam boilers and as such need to meet increased reliability requirements. These devices are classified as PSD-S in this document.

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 13611:2019, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 60529:1991+A1:2000+A2:2013+AC:2016, *Degrees of protection provided by enclosures (IP Code)(IEC 60529:1989+AMD1:1991+AMD2:2013)*

EN 60730-2-6:2016, *Automatic electrical controls — Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements*

EN 61058-1:2018, *Switches for appliances — Part 1: General requirements (IEC 61058-1:2016)*

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

EN ISO 75:2013, *(all parts),* Plastics — Determination of temperature of deflection under load

IEC 60730-1:2011, *Automatic electrical controls for household and similar use — Part 1: General requirements*

3 Terms and definitions

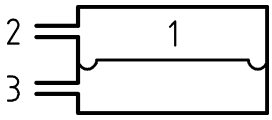
For the purposes of this document, the terms and definitions given in EN 13611:2019 and the following apply.

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

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

3.101
pressure sensing device
PSD
device which senses pressure and provides a signal

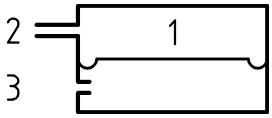
Note 1 to entry: Different types of PSDs are given in Figures 1 to 3.



Key

1 sensing element
2 inlet 1
3 inlet 2/reference

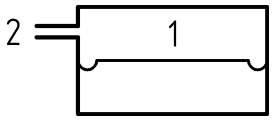
Figure 1 — Differential PSD



key

1 sensing element
2 inlet 1
3 reference

Figure 2 — Atmospheric PSD



Key

1 sensing element
2 inlet 1

Figure 3 — Absolute PSD

3.102
set point
pressure to which the PSD is adjusted to operate

3.103
switching pressure
inlet pressure at which the PSD operates

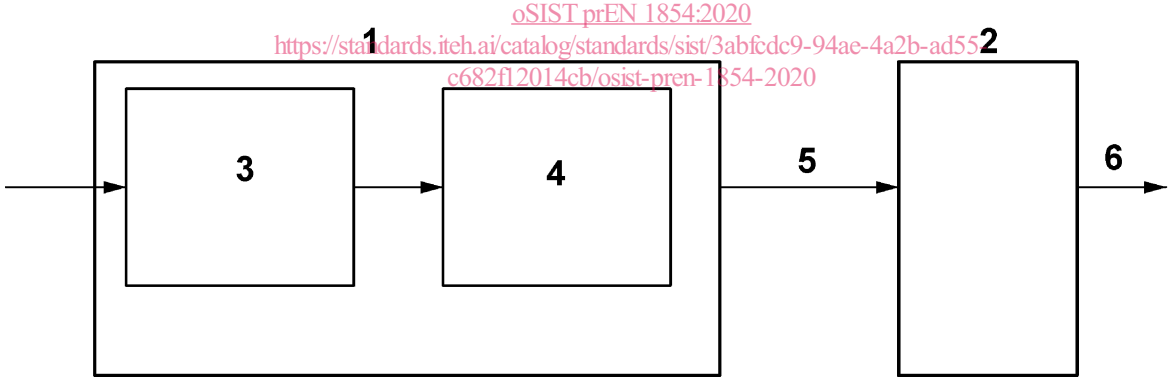
3.104
set point range
declared range of adjustment of the PSD between the highest and lowest set points

3.105
upper switching pressure
pressure at which the PSD operates during an increase in pressure

3.106
lower switching pressure
pressure at which the PSD operates during a decrease in pressure

3.107
electronic pressure sensing device
EPSD
assembly of electronic based pressure sensing element and signal conditioner

NOTE Figure 4, clarifies the EPSD.



Key
1 EPSD
2 Central Unit
3 Electronic pressure sensing element
4 Signal Conditioner
5 Interface
6 Switching

Figure 4 — EPSD

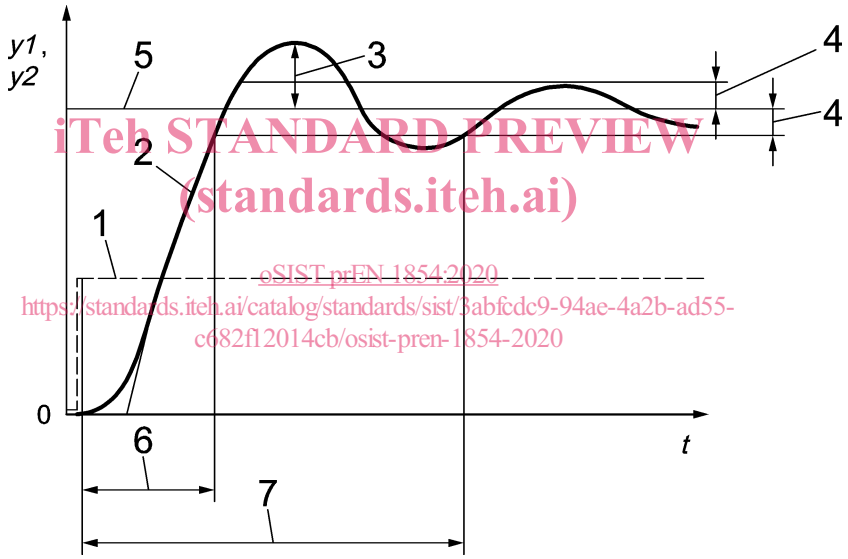
3.108
electronic pressure sensing element
part of the EPSD, which transforms the signal to be sensed (e.g. pressure) to another physical value (e.g. force, voltage)

3.109
signal conditioner
transforms the signal from the sensing element into the output signal of the EPSD

NOTE The signal conditioner may consist of functional electronics as well as electronics which cause the sensor output to be classified as class B or C in accordance with 4.3.

3.110
response time
time counted from start of the step change input signal (e.g. pressure) until the output signal (e.g. voltage, current) is within the settling tolerance for the first time

NOTE For further information refer to Figure 5.



Key

1	step function (*y1*)	5	steady-state value
2	step response (*y2*)	6	response time
3	overshoot value	7	settling time
4	settling tolerance	*t*	time

Figure 5 — Step response of EPSD

3.111
step response
output signal change of a device having a step change input signal

3.112
steady state value
value of the output signal after step response input remains constant

3.113
settling tolerance
maximum difference between the current output signal and its steady-state value as stated in the instructions

3.114
settling time
time counted from start of the step change input signal until the output signal remains within the settling tolerance

3.115
overshoot value
biggest deviation between the output signal and its steady-state value after step change of the inlet signal exceeding the settling tolerance for the first time

3.116
withstand pressure
pressure that is withstood without degraded characteristic after returning below the maximum inlet pressure

NOTE The withstand pressure can be equal to maximum inlet pressure.

3.117
deviation

difference between the declared or indicated set point and the pressure measured before the endurance test

3.118

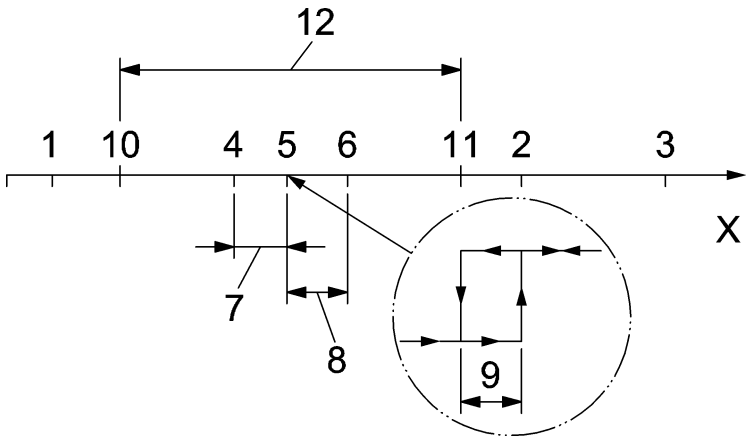
drift
difference between the switching pressures, or in case of EPSD the positive or negative shift of the sensor characteristic, measured before and after the endurance test

NOTE For illustration refer to Figure 7 and Figure 8.

3.119
repeatability
ability of a system to provide similar output for repeated operation

3.120
hysteresis
greatest differences between the upscale and downscale output readings or upper and lower switching pressure at one point

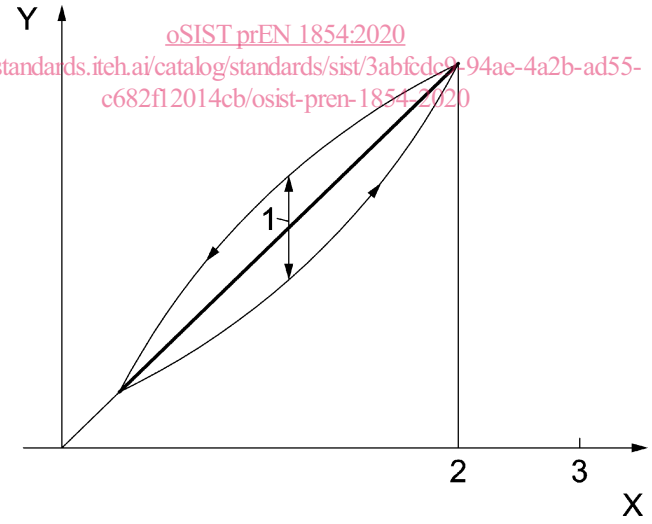
NOTE Clarification of the hysteresis in reference to other definitions of PSDs is given in Figure 6, 7 and 8.



Key

1	minimum inlet pressure	8	drift
2	maximum inlet pressure	9	hysteresis
3	withstand pressure	10	lowest set point
4	set point	11	highest set point
5	switching pressure (before endurance)	12	set point range
6	switching pressure (after endurance)	X	P-inlet/P-differential
7	deviation		

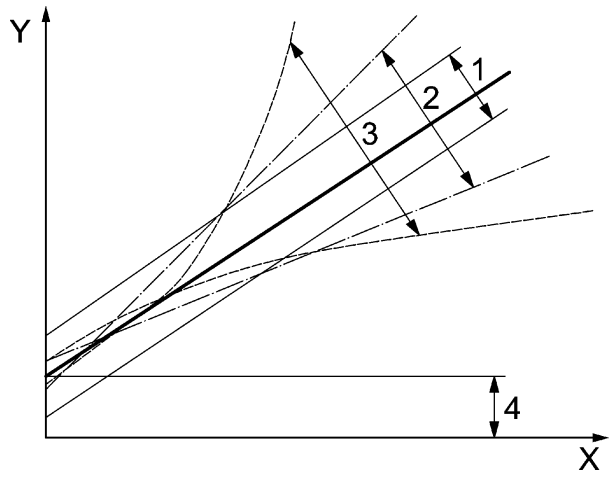
Figure 6 — Clarification of definitions for PSD-M and PSD-S



Key

1 hysteresis
2 maximum inlet pressure
3 withstand pressure
X P-inlet/P-differential
Y output signal

Figure 7 — Clarifications of hysteresis, maximum inlet and withstand pressure



Key

1 drift
2 transfer ratio
3 linearity
4 offset
X pressure
Y output signal

Figure 8 — Clarifications of drift, transfer ratio, linearity and offset

3.121
transfer ratio
positive or negative rotation of the sensor characteristic with the point of rotation as the intersection of the characteristic and the x-axis

NOTE For illustration refer to Figure 7 and Figure 8.

3.122
linearity
worst case deviation of straightness of the actual transfer function from the ideal straight line

NOTE For illustration refer to Figure 7 and Figure 8.

3.123
offset
positive or negative deviation of the intersection of the sensor characteristic and the y-axis

NOTE For illustration refer Figure 7 and Figure 8.

3.124
resolution
minimum incremental output change

3.125
safe state
state of the PSD with all output terminals deenergized or providing a signal (status) which ensures a safe situation of the subsequent central unit (refer to Figure 4, item 2)

4 Classification

4.1 Classes of control

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

Pressure sensing devices (PSDs) are classified as:

— PSD-M, being a mechanical pressure sensing device;

— PSD-S, being a PSD-M meeting increased requirements;

— EPSD, being an electronic pressure sensing device, including devices with variable output.

4.2 Groups of control

Shall be according to EN 13611:2019, 4.2 with the following modification:

Group 2 controls are not applicable for PSDs and/or EPSDs.

4.3 Classes of control functions

Shall be according to EN 13611:2019, 4.3. with the following addition:

— EPSDs can be only Class B or Class C control functions

— PSDs are not classified according to class A, B or C control functions.

4.4 Types of DC supplied controls

Shall be according to EN 13611:2019, 4.4

5 Test conditions and uncertainty of measurements

5.1 Test conditions

Shall be according to EN 13611:2019, 5.1

5.2 Uncertainty of measurements

Shall be according to EN 13611:2019, 5.2

6 Design and construction

6.1 General

Shall be according to EN 13611:2019, 6.1 with the following addition:

Clause 6 is applicable for PSD-M, PSD-S and EPSDs unless stated otherwise.

The minimum inlet pressure, the maximum inlet pressure and the withstand pressure shall be declared in the instructions. If no withstand pressure is declared, the withstand pressure is equal to the maximum inlet pressure. At the withstand pressure, devices shall comply with the requirements of this European Standard with the exception of 7.101.

The declared pressures can be positive or negative pressures.

6.2 Mechanical parts of the control

6.2.1 Appearance

Shall be according to EN 13611:2019, 6.2.1.

6.2.2 Holes

For PSDs and/or EPSDs designed for combustible gas **EN 13611:2019**, **6.2.2** applies.

6.2.3 Breather holes

6.2.3.1 Requirements

For PSDs and/or EPSDs designed for combustible gas and combustion products EN 13611:2019, 6.2.3.1 applies with the following addition:

The requirements of this clause are not applicable for PSDs and/or EPSDs with a maximum inlet pressure up to and including 60 kPa (600 mbar), which fulfil the requirements of 6.3.2.1.

6.2.3.2 Test for leakage of breather holes

Shall be according to EN 13611:2019, 6.2.3.2 with the following modification:

Use the withstand pressure instead of the maximum inlet pressure.

6.2.4 Screwed fastenings

Shall be according to EN 13611:2019, 6.2.4 with the following modification:

This requirement only applies to PSDs and EPSDs designed for combustible gas.

6.2.5 Jointing

Shall be according to EN 13611:2019, 6.2.5 with the following modification:

This requirement only applies to PSDs and/or EPSDs designed for combustible gas.

6.2.6 Moving parts

Shall be according to EN 13611:2019, 6.2.6

6.2.7 Sealing caps

Shall be according to EN 13611:2019, 6.2.7

6.2.8 Dismantling and reassembly

Shall be according to EN 13611:2019, 6.2.8

6.2.9 Auxiliary canals and orifices

Shall be according to EN 13611:2019, 6.2.9 with the following modification:

Orifices of all compartments used for pressure transmission shall have a minimum internal diameter of 0,7 mm, except in cases where a smaller orifice is protected against fouling and clogging by suitable measures, e.g. external filters (see 10.2, h)).

6.2.10 Presetting device

Shall be according to EN 13611:2019, 6.2.10

6.2.101 Manual reset

If a manual reset function is provided the reset action shall be independent of manipulation or position of the reset member.

NOTE Manual reset can require the use of a tool.

6.2.102 Sensed medium

In the instructions shall be declared the nature of the sensed medium for which the device is designed.

6.2.103 PSD-S

The additional construction requirements for PSD-S shall be as follows:

a) switching parts shall have the characteristics of a snap-acting contact as described in EN 61058-1:2018, 13.2 and 13.3

b) reed relays or reed contacts shall not be used;

c) pressure-stressed measurement parts shall be manufactured from materials resistant to corrosion for the intended use;

d) maximum declared ambient temperature shall be ≥ 70 °C;

e) the requirements of EN 60529:1991+A1:2000+A2:2013+AC:2016, IP44 shall be met as a minimum.

6.3 Materials

6.3.1 General material requirements

Shall be according to EN 13611:2019, 6.3.1.

6.3.2 Housing

6.3.2.1 Requirements

EN 13611:2018, 6.3.2.1 shall be replaced by the following:

Parts of the housing which directly or indirectly separate a gas-carrying compartment from atmosphere shall be made from:

a) metallic materials that have a melting point (solidus temperature) of at least 427 °C, or

b) metallic materials that conform to 6.3.3 or

c) non-metallic materials for PSDs and/or EPSDs with a withstand pressure up to and including 60 kPa (600 mbar) provided that;

   1) these gas carrying compartments are protected from the gas supply by a metallically housed metallic flow restrictor of less than 1 mm diameter; and

   2) a leakage rate of 70 dm^3/h of air is not exceeded after the test described in 6.3.2.2 b).