



SLOVENSKI STANDARD

SIST EN 1854:2023

01-marec-2023

Nadomešča:
SIST EN 1854:2010

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

Sicherheits- und Regeleinrichtungen für Brenner und Brennstoffgeräte für gasförmige
und/oder flüssige Brennstoffe - Druckwächter für Gasbrenner und Gasgeräte

Equipements auxiliaires pour brûleurs et appareils utilisant des combustibles gazeux ou
liquides - Dispositifs de surveillance de pression pour brûleurs à gaz et appareils à gaz

Ta slovenski standard je istoveten z: **EN 1854:2022**

ICS:

23.060.40	Tlačni regulatorji	Pressure regulators
27.060.20	Plinski gorilniki	Gas fuel burners

SIST EN 1854:2023 **en**

EUROPEAN STANDARD
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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**

Equipements auxiliaires pour brûleurs et appareils
utilisant des combustibles gazeux ou liquides -
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gaz et appareils à gaz

Sicherheits- und Regeleinrichtungen für Brenner und
Brennstoffgeräte für gasförmige und/oder flüssige
Brennstoffe - Druckwächter für Gasbrenner und
Gasgeräte

This European Standard was approved by CEN on 26 September 2022.

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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-CENELEC Management Centre has the same status as the official versions.

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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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EN 1854:2022 (E)**European foreword**

This document (EN 1854:2022) 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 June 2023, and conflicting national standards shall be withdrawn at the latest by December 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 1854:2010.

EN 1854:2022 includes the following significant technical changes with respect to EN 1854:2010:

- a) alignment with EN 13611:2019;
- b) reference to gas families removed;
- c) clarification regarding classified PSD's (Clause 3 and 4.1);
- d) technical changes to subclause 6.3.2 Housing;
- e) long-term performance of EPSD added (subclause 7.7);
- f) new reference to thermal stress test and vibration test.

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).

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

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.

Introduction

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

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, Annex BB, Annex CC, etc. 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 sensing device”.

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EN 1854:2022 (E)**1 Scope**

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

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 of pressure sensing devices for burners and appliances burning one or more gaseous fuels.

This document is applicable to pressure sensing devices for gaseous fuels, air, or combustion products with declared maximum inlet pressures up to and including 500 kPa.

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.

EN 13611:2019 Clause 1, 4th paragraph is not applicable.

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 13611:2019¹, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 60529:1991², *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60730-2-6:2016³, *Automatic electrical controls — Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements (IEC 60730-2-6:2015)*

EN ISO 75-1:2020, *Plastics — Determination of temperature of deflection under load — Part 1: General test method (ISO 75-1:2020)*

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

¹ As amended by EN 13611:2019/AC:2021.

² As amended by EN 60529:1991/A1:2000 and EN 60529:1991/A2:2013 (EN 60529:1991/A2:2013/AC:2019-02), and corrected by EN 60529:1991/AC:2016-12 and EN 60529:1991/corrigendum May 1993.

³ As amended by EN 60730-2-6:2016/A1:2020.

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 terminology 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/>

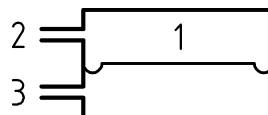
3.101

pressure sensing device

PSD

device which senses pressure and provides a signal

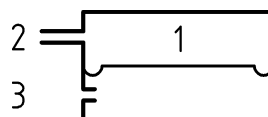
Note 1 to entry: Different types of PSDs are given in Figures 1 to 3.



Key

- 1 sensing element
- 2 inlet 1
- 3 inlet 2/reference

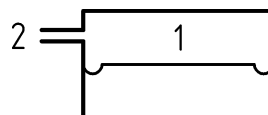
Figure 1 — Differential PSD



Key

- 1 sensing element
- 2 inlet 1
- 3 reference

Figure 2 — Atmospheric PSD



Key

- 1 sensing element
- 2 inlet 1

Figure 3 — Absolute PSD

EN 1854:2022 (E)

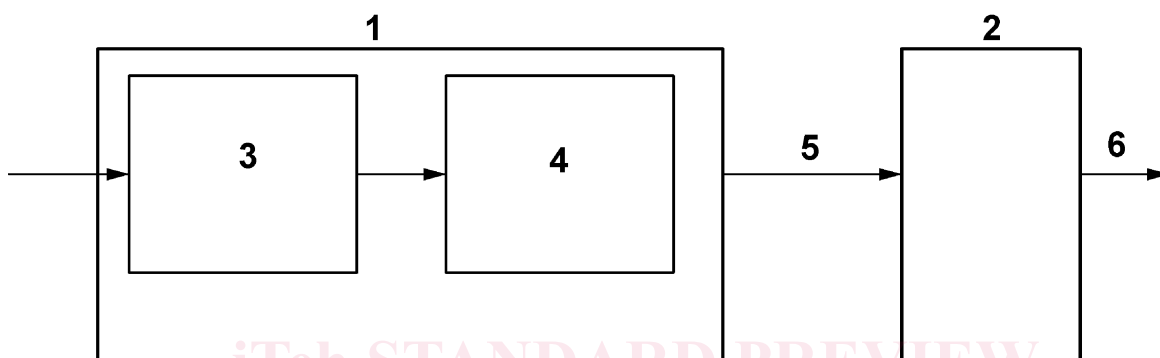
3.101.1**electromechanical pressure sensing device****MPSD (PSD-M, PSD-S)**

assembly of mechanical based pressure sensing element and one or more electrical switches

3.101.2**electronic pressure sensing device****EPSD**

assembly of electronic based pressure sensing element and signal conditioner

Note 1 to entry: Figure 4 clarifies the EPSD.

**Key**

- 1 EPSD
- 2 central unit e.g. burner control system
- 3 electronic pressure sensing element
- 4 signal conditioner
- 5 interface
- 6 switching output

Figure 4 — EPSD

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 MPSD 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 element**

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

3.108**signal conditioner**

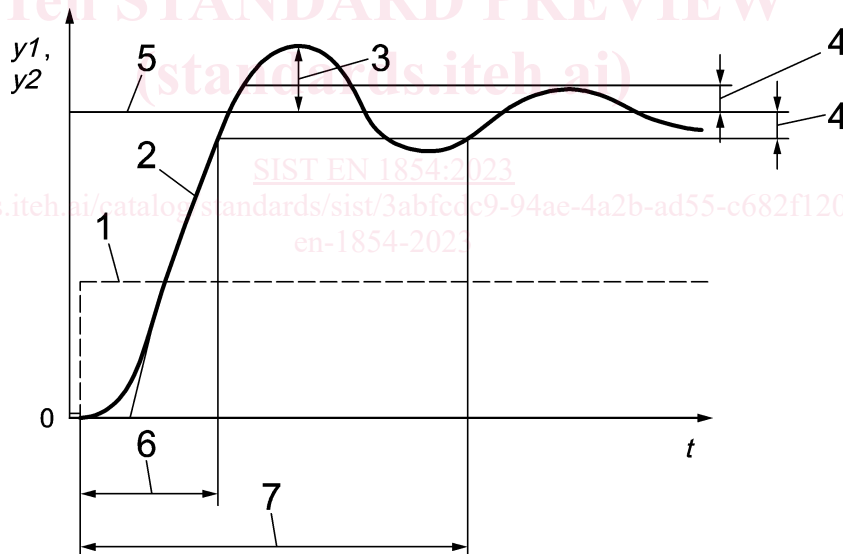
transforms the signal from the sensing element into the output signal of the EPSD

Note 1 to entry: 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.

3.109**response time**

time counted at an EPSD 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 1 to entry: For further information refer to Figure 5.

**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 5 — Step response of EPSD

3.110**step response**

output signal change of an EPSD having a step change input signal

EN 1854:2022 (E)**3.111****steady state value**

value of the output signal of an EPSD after step response input remains constant

3.112**settling tolerance**

maximum difference between the current output signal of an EPSD and its steady-state value as stated in the instructions

3.113**settling time**

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

3.114**overshoot value**

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

3.115**withstand pressure**

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

Note 1 to entry: The withstand pressure can be equal to the maximum inlet pressure.

3.116**deviation**

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

3.117**drift****<MPSD>**

difference between the switching pressures, measured before and after the endurance test

Note 1 to entry: For illustration refer to Figure 6 and Figure 8.

Note 2 to entry: For MPSD see 7.101.1.3.

3.118**drift****<EPSD>**

the positive or negative shift of the sensor characteristic, measured before and after the thermal stress test

Note 1 to entry: For illustration refer to Figure 6 and Figure 8.

Note 2 to entry: For EPSD see 7.101.2.5.

3.119**repeatability**

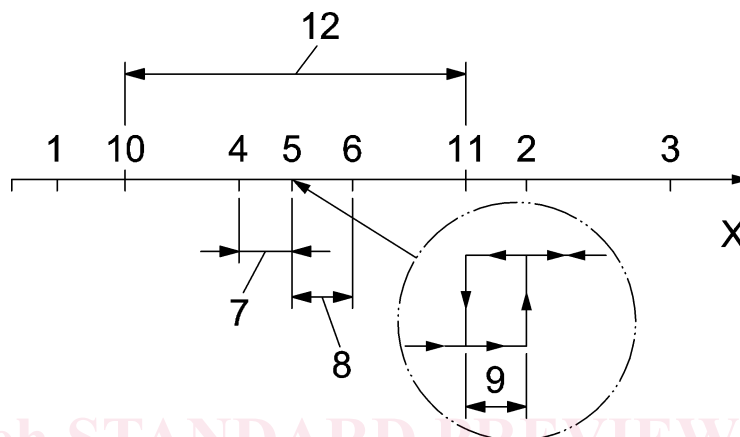
ability of an EPSD to provide similar output for repeated operation

3.120**hysteresis**

greatest differences of a PSD between the upscale and downscale output readings or upper and lower switching pressure at one point or the greatest difference between the ascending and the descending line of the characteristic

Note 1 to entry: For illustration refer to Figure 6 and Figure 7.

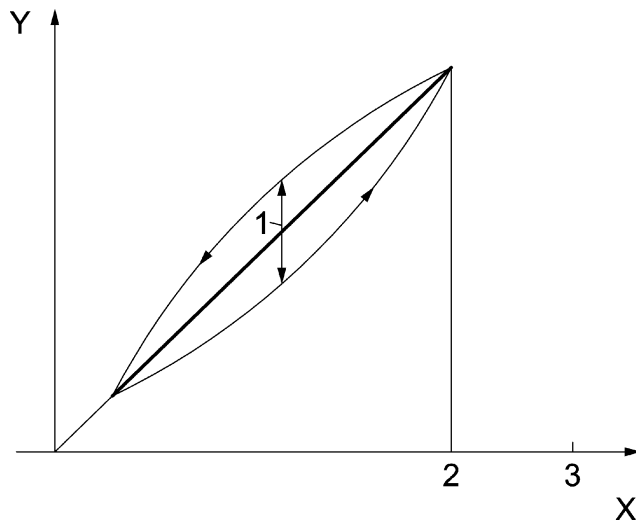
Note 2 to entry: For MPSD see 7.101.1.4 for EPSD see 7.101.2.4.

**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	inlet pressure/ differential pressure
7	deviation		

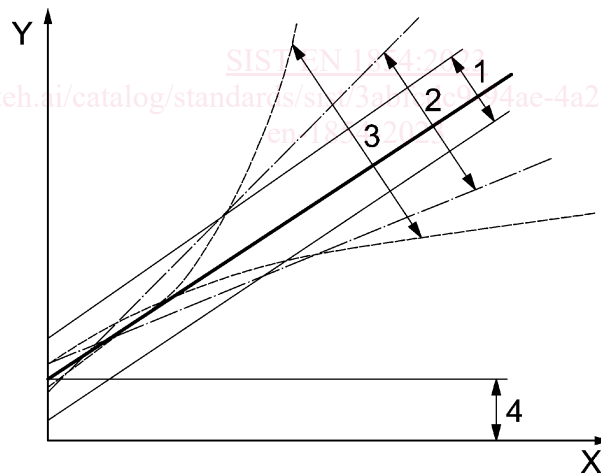
Figure 6 — Clarification of definitions for a PSD

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**Key**

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

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

**Key**

- 1 drift
- 2 transfer ratio
- 3 linearity
- 4 offset
- X inlet pressure/ differential pressure
- Y output signal

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

3.121**transfer ratio**

positive or negative rotation of an EPSD characteristic with the point of rotation as the intersection of the characteristic and the inlet pressure / differential pressure

Note 1 to entry: For illustration refer to Figure 8.

3.122**linearity**

worst case deviation of straightness of the actual transfer function of an EPSD from the ideal straight line

Note 1 to entry: For illustration refer to Figure 8.

3.123**offset**

positive or negative deviation of the intersection of the sensor characteristic of an EPSD and the output signal

Note 1 to entry: For illustration refer Figure 8.

3.124**resolution**

minimum incremental output change of an EPSD

3.125**safe state**

state of the EPSD providing a signal (status) which is intended to ensure a safe situation of subsequent controls

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4 Classification**4.1 Classes of control**

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

Pressure sensing devices (PSDs) are classified as:

- Electromechanical pressure sensing device (MPSD)
 - PSD-M, being an electromechanical pressure sensing device;
 - PSD-S, for steam boilers, being a PSD-M meeting increased requirements;
- Electronic pressure sensing device (EPSD), 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.