

SLOVENSKI STANDARD

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Mehanski termostati za plinske aparate

Mechanical thermostats for gas-burning appliances

Mechanische Temperaturregler für Gasgeräte

Thermostats mécaniques pour appareils à gaz

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Mechanical thermostats for gas-burning appliances

Thermostats mécaniques pour appareils à gaz

Mechanische Temperaturregler für Gasgeräte

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

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EN 257:2022 (E)**European foreword**

This document (EN 257:2022) 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of an identical text or by endorsement, at the latest by April 2023, and conflicting national standards shall be withdrawn at the latest by October 2025.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 257:2010.

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

- a) alignment with EN 13611:2019;
- b) requirements from EU Directive 2014/68/EU were not adopted;
- c) updating of Clause 2, normative references;
- d) reference to EN 437 removed;
- e) 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.

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.

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).

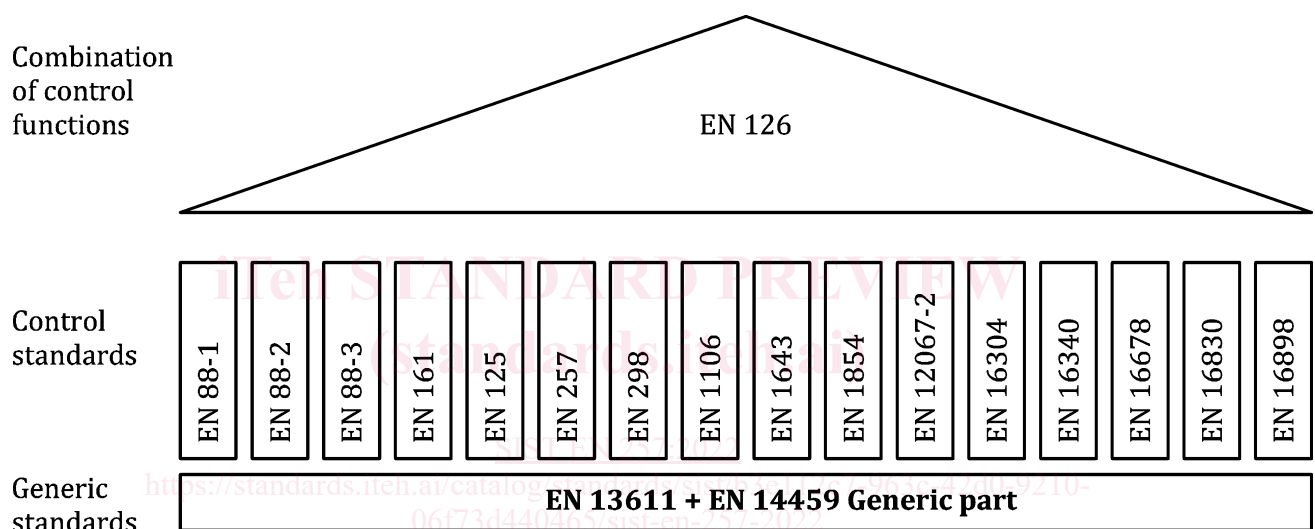


Figure 1 — Interrelation of control standards

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.

EN 257:2022 (E)

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, 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 “thermostat”.

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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 mechanical thermostats intended for use with gas appliances and similar use, hereafter referred to as “thermostats”.

This document is applicable to thermostats with declared maximum inlet pressures up to and including 50 kPa and of nominal connection sizes up to and including DN 50 for use with one or more fuel gases.

Addition:

This document is applicable to thermostats controlling the gas flow directly or indirectly through an integral gas valve. This document applies to thermostats used with gas appliances which are not installed in the open air.

Thermostats dealt with in this document are intended for control functions.

This document is not applicable to:

- a) controls which use auxiliary energy (e.g. electrical energy supplied externally);
- b) an assessment of the control regarding Performance Level (PL) and Safety Integrity Level (SIL).

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 13611:2019², *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — 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 <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.101

mechanical thermostat

thermostat which controls the temperature by adjusting the flow rate accordingly to the temperature of the sensor without any external energy, such that the temperature remains within defined limits

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

EN 257:2022 (E)**3.102****adjustable thermostat**

mechanical thermostat in which the temperature set-point can be adjusted by the user to anywhere between minimum and maximum values

3.103**fixed setting thermostat**

mechanical thermostat that has a preset fixed operating temperature which cannot be adjusted by the user

3.104**snap-acting thermostat**

mechanical thermostat with only two positions for the flow rate, i.e. "full on-off", "full on-reduced rate" or "reduced rate-off"

3.105**modulating thermostat**

mechanical thermostat which controls the flow rate in accordance with a predetermined and continuous function of the temperature of the temperature sensor

3.106**modulating thermostat with additional on-off action**

mechanical thermostat which acts as a snap-acting thermostat between the closed and reduced positions and as a modulating thermostat between the reduced and full-on positions

3.107**thermostat closure member**

movable part of the thermostat which opens and closes the gas way and/or varies the flow rate

3.108**presetting device**

device for adjusting an operating condition only by an authorized person

Note 1 to entry: It may be fixed or variable, e.g. when it is the gas flow that is adjustable; either an orifice or an adjusting screw may be used.

3.109**fixed bypass**

non-adjustable presetting device for fixing the minimum gas flow through a thermostat

3.110**bypass adjusting device**

screw adjustment or an exchangeable orifice, that fixes the minimum gas flow rate through the thermostat, and which is accessible only by the use of tools

3.111**temperature sensor**

device which senses the temperature of the medium to be controlled or to be supervised

3.112**operating curve**

graphical representation of the flow rate as a function of the sensor temperature at a given temperature set-point and at a constant inlet pressure

3.113**backlash**

difference of position of the adjusting knob when it is moved in both directions to obtain the same flow rate at a constant sensor temperature

3.114**adjusting knob****adjustable spindle**

part of the thermostat which is used to select the temperature set-point

3.115**temperature set-point**

any value selected within the temperature range at which the controlled temperature should be maintained

3.116**temperature set-point range**

range between the minimum and maximum adjustable temperature set-points

Note 1 to entry: The temperature can be adjusted between the set-points by means of the adjusting knob.

3.117**calibration flow rate**

flow rate stated in the instructions for calibration

3.118**calibration temperature set-point**

temperature at which the calibration flow rate should be obtained with the adjustment set to the position and in the direction stated in the instructions [N 257:2022](https://standards.iteh.ai/catalog/standards/sist/b3e112c7-963c-42d0-9210-06f73d440465/sist-en-257-2022)

3.119**temperature differential for snap-acting thermostats**

difference in temperature necessary to obtain a change in the flow rate, at a given set-point

3.120**deviation**

maximum deviation from the temperature set-point which is stated in the instructions

3.121**drift**

permanent change in the operating curve of the thermostat

4 Classification**4.1 Classes of control**

EN 13611:2019, 4.1 is not applicable.

4.2 Groups of control

Shall be according to EN 13611:2019, 4.2.

4.3 Classes of control functions

EN 13611:2019, 4.3 is not applicable.

EN 257:2022 (E)**4.4 Types of *DC* supplied controls**

EN 13611:2019, 4.4 is not applicable.

5 Test conditions and uncertainty of measurements

Shall be according to EN 13611:2019, Clause 5.

6 Design and construction**6.1 General**

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

The 3rd paragraph of EN 13611:2019, 6.1 is not applicable.

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

Shall be according to EN 13611:2019, 6.2.2.

6.2.3 Breather holes

Shall be according to EN 13611:2019, 6.2.3.

6.2.4 Screwed fastenings

Shall be according to EN 13611:2019, 6.2.4.

6.2.5 Jointing

Shall be according to EN 13611:2019, 6.2.5.

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 with the following addition:

If, in accordance with the instructions the thermostat can be dismantled for servicing, such action shall not result in a change in temperature calibration exceeding the stated maximum set-point deviation (see 7.101.1).

6.2.9 Auxiliary canals and orifices

Shall be according to EN 13611:2019, 6.2.9.

6.2.10 Presetting device

Shall be according to EN 13611:2019, 6.2.10.

6.3 Materials

Shall be according to EN 13611:2019, 6.3.

6.4 Gas connections

Shall be according to EN 13611:2019, 6.4.

6.5 Electrical parts of the control

EN 13611:2019, 6.5 is not applicable.

6.6 Protection against internal faults for the purpose of functional safety

EN 13611:2019, 6.6 is not applicable.

6.101 Flow characteristics

An adjustable bypass shall be set by means of a variable presetting device or shall be adjusted by means of a fixed presetting device.

It shall be possible to gain access to any fixed bypass or bypass adjusting device for cleaning without changing the calibration temperature set-point.

The opening and closing of the thermostat closure member with a total shut-off function shall happen by snap-action between the off position and the reduced flow position.

NOTE Figure 3 shows typical operating curves of a modulating, snap-acting and modulating on-off thermostat.

The flow rate at the moment of snap-action shall not be less than the value as stated in the instructions.

6.102 Temperature adjustment

6.102.1 Range adjustment

The allowed temperature setting range shall be limited by stops. Where applicable, the instructions shall state the limits in which the temperature setting range may be adjusted using appropriate tools. The temperature setting range stops shall not change on their own accord.

6.102.2 Set-point adjustment

If the adjusting knob is supplied as part of the thermostat, the marking of its positions shall be easily recognizable. It shall indicate the direction in which the temperature is raised or lowered. If numbers are used, higher numbers shall indicate higher temperatures, except for thermostats for refrigerators where higher numbers shall indicate lower temperatures.

It shall be possible to select any temperature set-point over the whole temperature range by setting the adjusting knob or spindle between the stops within the maximum and minimum ambient temperatures as stated in the instructions.

The temperature setting means shall not change on its own accord.

6.102.3 Fixed setting thermostat

If provided, the adjuster of a fixed setting thermostat shall be sealed (e.g. lacquer).