



SLOVENSKI STANDARD

oSIST prEN 16830:2021

01-januar-2021

**Varnostne in nadzorne naprave za gorilnike in aparate na plin ali tekoča goriva -
Regulacijske in nadzorne funkcije v elektronskih sistemih - Regulacija temperature**

Safety and control devices for burners and appliances burning gaseous or liquid fuels -
Control functions in electronic systems - Temperature Control function

Sicherheits- und Regeleinrichtungen für Brenner und Brennstoffgeräte für gasförmige
oder flüssige Brennstoffe - Regelfunktionen in elektronischen Systemen -
Temperaturüberwachungsfunktion

Équipements auxiliaires pour brûleurs et appareils utilisant des combustibles gazeux ou
liquides - Dispositifs de contrôle des systèmes électroniques - Dispositifs de régulation
de la température

Ta slovenski standard je istoveten z: prEN 16830

ICS:

| | | |
|-----------|-------------------|------------------|
| 27.060.20 | Plinski gorilniki | Gas fuel burners |
| 97.100.20 | Plinski grelniki | Gas heaters |

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en,fr,de

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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ICS 91.140.40; 97.100.20

Will supersede EN 16830:2017

English Version

Safety and control devices for burners and appliances burning gaseous or liquid fuels - Control functions in electronic systems - Temperature Control function

Équipements auxiliaires pour brûleurs et appareils
utilisant des combustibles gazeux ou liquides -
Dispositifs de contrôle des systèmes électroniques -
Dispositifs de régulation de la température

Sicherheits- und Regeleinrichtungen für Brenner und
Brennstoffgeräte für gasförmige oder flüssige
Brennstoffe - Regelfunktionen in elektronischen
Systemen - Temperaturüberwachungsfunktion

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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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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prEN 16830:2021 (E)**European foreword**

This European standard (prEN 16830:2021) 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 16830:2017.

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

- alignment to EN 13611:2019;
- terms and definitions are aligned to EN 13611:2019;
- [to be done]]

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Introduction

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

The generic 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 14459:2015.

This control standard 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, subclauses or annexes that are additional to those in EN 13611:2019 are numbered starting from 101 or are designated as Annex AA, BB, CC etc.

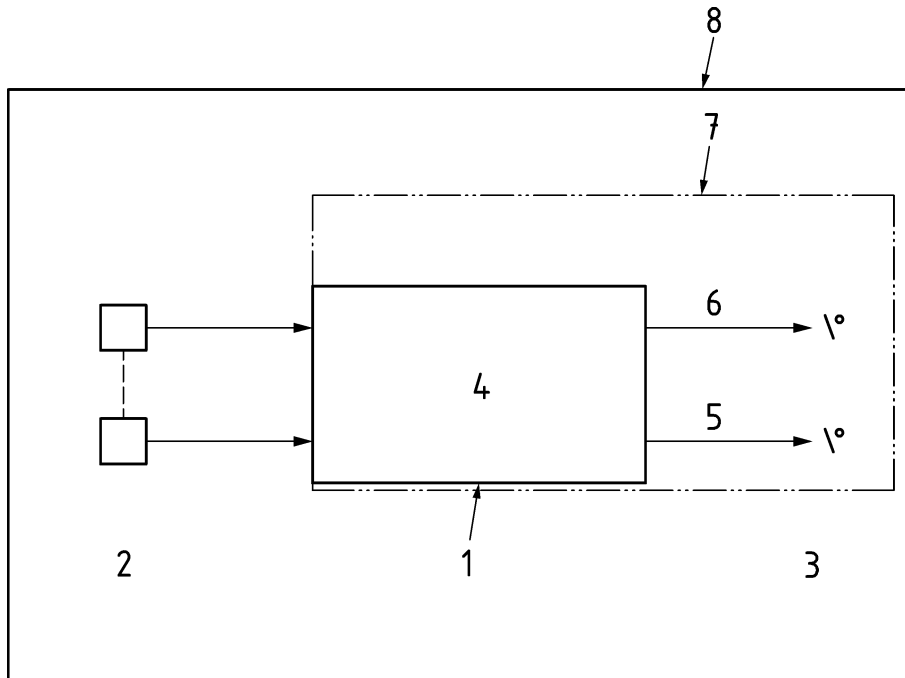
This control standard describes requirements for two types of temperature-based Appliance Control Functions.

1) Temperature Control Function

The temperature control function (in the following called TCF) is a system that consists of temperature sensing, signal processing, switching actions (on/off or protective action) and reset (see Figure 1).

The purpose of a TCF is to control the temperature (temperature regulator) and to prevent the risk of excessive temperature (temperature limiter) which could lead to the hazard of overheating for gas and liquid fuel burning appliances. A TCF requires a class C system, based on a comparison, made between an automatic burner control system and a temperature control function, the implication on safety of either function being considered equivalent. Gas and liquid fuel appliance standards can allow a lower class in combination with constructional measures, as long as the overall result for TCF is a class C.

Traditional solutions, using a combination of mechanical thermostats as specified in the appliance standards (e.g. EN 15502-1) have been considered to fulfil the requirements. This assumption is based on specific mechanical solutions, originating from practice over many years and relying on redundancy as the principle.

**Key**

| | | | |
|---|---|---|------------------------------|
| 1 | reset | 5 | protective action |
| 2 | sensing element(s) | 6 | on/off action |
| 3 | switching action(s) | 7 | control |
| 4 | temperature regulator and protective controller | 8 | temperature control function |

Figure 1 — Temperature control function

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2) TTB

The Appliance Control Function TTB (Combustion Product Discharge Safety Device) is intended to provide protection against poisoning and suffocation in case of a (partially) blocked flue. This clause provides the requirements for electronic TTBs consisting of:

- a control that can take a protective action and
- a sensing element that monitors a significant physical value in relation to the spillage of combustion products into the environment where the gas appliance is installed.

If the spillage reaches a pre-set level, the TTB should initiate a protective action. Allowable spillage is determined by the application standard.

NOTE Instead of TTB, the term “Combustion Product Discharge Safety Device” is used in EN 15502-2-2.

For both TTB and TCF, the requirements in this document are applicable to the combination of sensing element and control.

1 Scope

This document specifies the safety, design, construction, performance requirements and testing of Temperature Control Functions (TCF) and Combustion Product Discharge Safety Devices (TTB) for gas and liquid fuel burners and appliances burning one or more gaseous or liquid fuels, hereafter referred to as 'TCF' or 'TTB'.

It also describes the test procedures for checking compliance with these requirements.

This document is applicable to AC and DC supplied TCF and TTB (for TCF and TTB supplied by stand-alone battery system, battery systems for mobile applications or systems which are intended to be connected to DC supply networks, see Annex I).

This document is applicable to electronically based TTB and TCF only.

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 60730-1:2016, *Automatic electrical controls - Part 1: General requirements*

EN IEC 60730-2-9:2019, *Automatic electrical controls - Part 2-9: Particular requirements for temperature sensing control.*

3 Terms and definitions

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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 <https://www.iso.org/obp>".

3.101

multifunctional control

MFC

combination of two or more controls and/or Application Control Function(s) whereby the functional parts cannot operate if separated

3.102

application control function

ACF

function to protect against harm(s) originating from a specific hazard by providing safe operation of gas burners and gas burning appliances

Note 1 to entry: The assembly to provide this function may consist of a combination of controls and/or multifunctional control(s) (e.g. actuators, sensors and control electronics).

prEN 16830:2021 (E)**3.103****combustion products discharge safety device****TTB**

appliance control function that at least causes safety shutdown of the main burner when there is an unacceptable spillage of combustion products at the draught diverter

[SOURCE: EN 15502-2-2:2014, 3.1.4.101]

3.104**temperature control function****TCF**

appliance control function that controls the temperature (temperature regulator) and prevents the risk of excessive temperature (temperature limiter) which could lead to the hazard of overheating in gas and liquid fuel burning appliances by initiating at least a safety shutdown of the main burner

4 Classification**4.1 Classes of control****4.1.1 TTB**

A TTB control function can be class A, class B or class C, depending on the application. The class of the TTB control function shall be stated in the instructions.

4.1.2 TCF

The TCF shall be a class C control function.

A lower class may be acceptable if this is proven by the analysis of the preventative measures within the appliance. The class of the TCF shall be stated in the instructions.

A TCF may consist of various independent hardware and software devices. These individual devices, being part of the TCF, shall be classified as class A, class B or class C.

4.2 Groups of control

EN 13611:2019, 4.2 is not applicable.

4.3 Classes of control functions

Shall be according to EN 13611:2019, 4.3.

4.4 Types of DC supplied controls

Shall be according to EN 13611:2019, 4.4.

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.

6.2 Mechanical parts of the control

EN 13611:2019, 6.2 is not applicable.

6.3 Materials

EN 13611:2019, 6.3 is not applicable.

6.4 Gas Connections

EN 13611:2019, 6.4 is not applicable.

6.5 Electrical parts of the control

6.5.1 General

Shall be according to EN 13611:2019, 6.5.1 with the following addition:

The switching actions and the reset as indicated in Figure 1 are an integral part of the TCF. For multifunctional controls, the TCF or parts of it can be physically integrated in other functional blocks (e.g. automatic burner control system).

6.5.2 Switching elements

EN 13611:2019, 6.5.2 applies only to class C TCF and TTB which directly de-energize safety related output terminals controlling shutdown of the entire fuel supply to the appliance.

6.5.3 Electrical components

6.5.3.1 Performance of electrical components

Shall be according to EN 13611:2019, 6.5.3.1 prEN 16830:2021

6.5.3.2 Tests

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Shall be according to EN 13611:2019, 6.5.3.2.

6.5.3.3 Sensing element

Shall be according to EN 13611:2019, 6.5.3.3 with the following addition:

To withstand temperature overshoot after a protective action, the sensing element, being in contact with this temperature, shall be able to withstand a maximum temperature as declared in 7.1. This is the maximum temperature that the sensor will face in its application for a short period of time. During the long-term performance tests of 7.10.101 b) and d) this extreme temperature shall be maintained for 10 min each for the last 10 cycles.

The sensing element of the TTB shall not be removable without tools. Incorrect refitting, after servicing shall be made difficult.

For TCF Appliance Control Functions, where the safety depends on the correct location of the sensing elements, these sensing elements shall not be removable without tools. Incorrect refitting after servicing shall be made difficult.

For TTB and TCF based on sensors other than temperature sensors, equivalent requirements shall be applied.

6.5.3.4 Gas controls employing electrical components in the gas circuit

EN 13611:2019, 6.5.3.4 is not applicable.

prEN 16830:2021 (E)**6.6 Protection against internal faults for the purpose of functional safety****6.6.1 Design and construction requirements****6.6.1.1 Fault avoidance and fault tolerance****6.6.1.1.1 General**

Shall be according to EN 13611:2019, 6.6.1.1.1 with the following additions:

- a) A TCF shall be ~~safety~~ class C control function. EN 13611:2019, 6.6.4.2 c) and 6.6.4.3 a), are not applicable. The fault reaction time shall be stated in the instructions.
- b) For TTB classified as class B control function the requirements for protection against internal faults for the purpose of functional safety as given in 6.6 of EN 13611:2019 shall apply, with the exception of EN 13611:2019, 6.6.3.2 c). The fault reaction time shall be stated in the instructions with a limit of 24 h.
- c) For TTB classified as class C control function the requirements for protection against internal faults for the purpose of functional safety as given in 6.6 of EN 13611:2019 shall apply, with the exception of EN 13611:2019, 6.6.4.2 c) and 6.6.4.3 a). The fault reaction time shall be stated in the instructions.

6.6.1.1.2 Design

Shall be according to EN 13611:2019, 6.6.1.1.2.

6.6.1.2 Lock-out function

Shall be according to EN 13611:2019, 6.6.1.2.

6.6.1.3 Reset device

Shall be according to EN 13611:2019, 6.6.1.3.

6.6.1.4 Design Documentation

Shall be according to EN 13611:2019, 6.6.1.4.

6.6.2 Class A

Shall be according to EN 13611:2019, 6.6.2.

6.6.3 Class B**6.6.3.1 Design and construction requirements**

Shall be according to EN 13611:2019, 6.6.3.1.

6.6.3.2 First fault

Shall be according to EN 13611:2019, 6.6.3.2 with the following modification:

For TTB and TCF-subassemblies declared as class B, EN 13611:2019, 6.6.3.2 c) is not applicable.

6.6.3.3 Fault introduced during lock-out or safety shutdown

Shall be according to EN 13611:2019, 6.6.3.3.

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