



# SLOVENSKI STANDARD

## SIST EN 16830:2017

01-december-2017

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**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: EN 16830:2017**

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**ICS:**

27.060.20	Plinski gorilniki	Gas fuel burners
97.100.20	Plinski grelniki	Gas heaters

**SIST EN 16830:2017**

**en,fr,de**

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EUROPEAN STANDARD

**EN 16830**

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

This European Standard was approved by CEN on 23 October 2016.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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**EN 16830:2017 (E)****European foreword**

This document (EN 16830:2017) 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 September 2017, and conflicting national standards shall be withdrawn at the latest by September 2017.

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.

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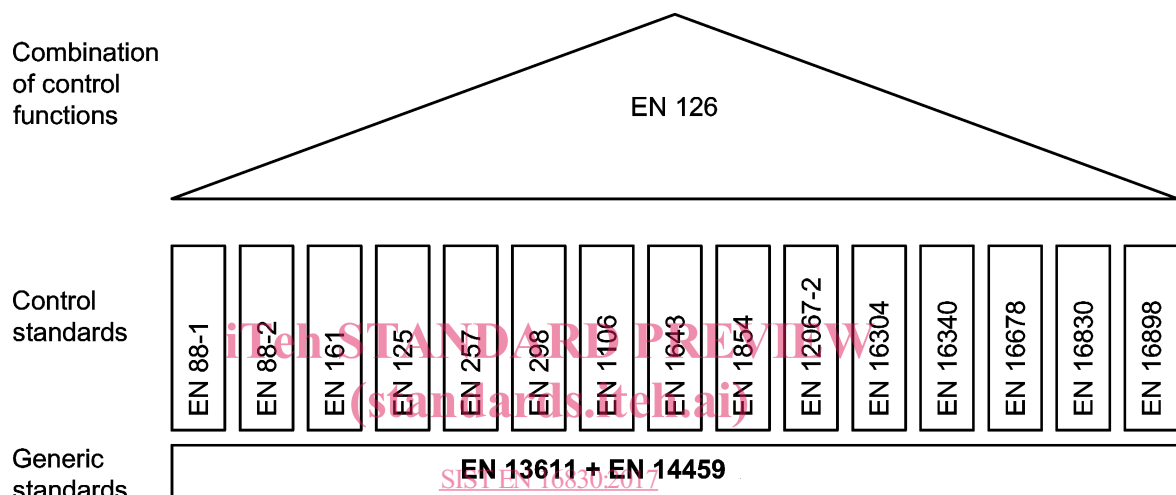
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## Introduction

The generic requirements for controls are given in EN 13611 and methods for classification and assessment for new controls and control functions are given in EN 14459 (see Figure 1).

The requirements for controls are given in the specific control standard (see Figure 1).

Multifunctional Controls (MFC) according to EN 126:2012 and EN 126:2012/prA1:2014 with two or more controls and Application Control Functions, e.g. the Gas Shut-off Control Function, being inherently multifunctional controls. Each control integrated in the MFC should meet the applicable requirements of the relevant control standard(s). In addition, EN 126:2012 and EN 126:2012/prA1:2014 cover requirements for the safety related interactions between the different devices.



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Figure 1 – Standards house

This control standard refers to clauses of EN 13611:2015 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 13611:2015 which are particular to this European Standard, i.e. subclauses or annexes that are additional to those in EN 13611:2015 are numbered starting from 101 or are designated as Annex AA, BB, CC etc. It should be noted that these clauses and subclauses are not indicated as an addition.

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 2).

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 safety class C system, based on a comparison, made between an automatic burner controller 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 safety class in combination with constructional measures, as long as the overall result for TCF is a safety class C.

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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.

## 2) TTB

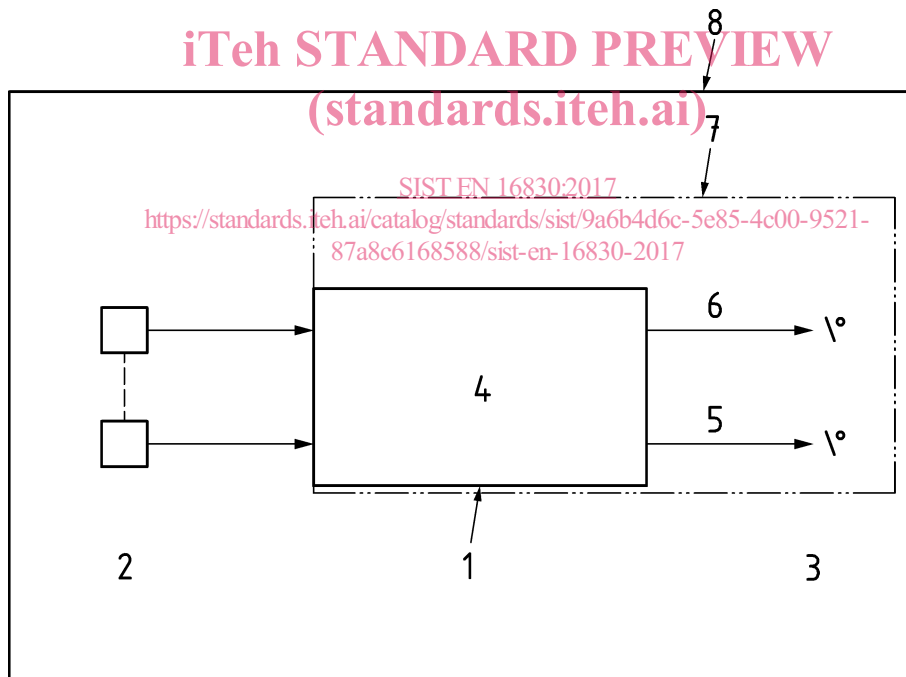
The Appliance Control Function TTB (Combustion Product Discharge Safety Device) is intended to provide protection against poisoning and suffocation in case of a (partially) blocked flue. This clause provides the requirements for electronic TTBs consisting of:

- 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 European Standard are applicable to the combination of sensing element and control.



## Key

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

**Figure 2 — Temperature control function**



## 1 Scope

This European Standard specifies the safety, design, construction and performance requirements for Temperature Control Function (TCF) and Combustion Product Discharge Safety Device (TTB) intended for use with burners and appliances using gaseous or liquid fuels.

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

This European Standard 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 European Standard is applicable to electronically based TTB and TCF only.

## 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 13611:2015, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels - General requirements*

EN 60730-2-9:2010, *Automatic electrical controls for household and similar use — Part 2-9: Particular requirements for temperature sensing controls (IEC 60730-2-9:2008, modified)*

## 3 Terms and definitions (standards.iteh.ai)

For the purposes of this document, the terms and definitions given in EN 13611:2015 and the following apply.

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### 3.101

#### **control**

device that provides functionality as described in the specific control standard

### 3.102

#### **multifunctional control**

#### **MFC**

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

### 3.103

#### **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).

**EN 16830:2017 (E)****3.104****combustion products discharge safety device****TTB**

appliance control function that at least causes safety shut-down 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]

**3.105****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 shut-down of the main burner

**4 Classification****4.1 Classes of control**

EN 13611:2015, 4.1 is replaced by the following:

The safety class of a TTB Appliance Control Function can be class A, class B or class C, depending on the application. The safety class of the TTB shall be stated in the installation and operating instructions.

The TCF shall be safety class C

A lower class may be acceptable if this is proven by the analysis of the preventative measures within the appliance. The safety class of the TCF shall be stated in the installation and operating 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 13611:2015, 4.2 is not applicable.

**4.3 Classes of control functions**

Shall be according to EN 13611:2015, 4.3.

**4.4 Types of DC supplied controls**

Shall be according to EN 13611:2015, 4.4.

**5 Test conditions and measurement tolerances**

Shall be according to EN 13611:2015, Clause 5.

**6 Construction requirements****6.1 General**

Shall be according to EN 13611:2015, 6.1.

**6.2 Mechanical parts of the control**

EN 13611:2015, 6.2 is not applicable.

## 6.3 Materials

EN 13611:2015, 6.3 is not applicable.

## 6.4 Gas Connections

EN 13611:2015, 6.4 is not applicable.

## 6.5 Electrical parts of the control

### 6.5.1 General

Shall be according to EN 13611:2015, 6.5.1 with the following addition:

The switching actions and the reset as indicated in Figure 2 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).

### 6.5.2 Switching elements

Shall be according to EN 13611:2015, 6.5.2.

### 6.5.3 Electrical components

#### 6.5.3.1 Performance of electrical components

Shall be according to EN 13611:2015, 6.5.3.1.

#### 6.5.3.2 Test

Shall be according to EN 13611:2015, 6.5.3.2.

#### 6.5.3.3 Sensing element

Shall be according to EN 13611:2015, 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 way

EN 13611:2015, 6.5.3.4 is not applicable.

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**EN 16830:2017 (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 13611:2015, 6.6.1.1.1 with the following addition:

- TCF shall be safety class C.

EN 13611:2015, 6.6.4.2 c) and 6.6.4.3 a), are not applicable.

The fault reaction time shall be stated in the installation and operating instructions.

- TTB as a class B function

The requirements for protection against internal faults for the purpose of functional safety as given in 6.6 of EN 13611:2015 shall apply, with the exception of EN 13611:2015, 6.6.3.2 c).

The fault reaction time shall be stated in the installation and operating instructions with a limit of 24 h.

- TTB as a class C function

Requirements for protection against internal faults for the purpose of functional safety as given in 6.6 of EN 13611:2015 shall apply, with the exception of EN 13611:2015, 6.6.4.2 c) and 6.6.4.3 a).

The fault reaction time shall be stated in the installation and operating instructions.

**6.6.1.1.2 System design**

Shall be according to EN 13611:2015, 6.6.1.1.2.

**6.6.1.2 Lock-out function**

Shall be according to EN 13611:2015, 6.6.1.2.

**6.6.1.3 Reset device**

Shall be according to EN 13611:2015, 6.6.1.3.

**6.6.1.4 Documentation**

Shall be according to EN 13611:2015, 6.6.1.4.

**6.6.2 Class A**

Shall be according to EN 13611:2015, 6.6.2.

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

Shall be according to EN 13611:2015, 6.6.3.1.

**6.6.3.2 First fault**

Shall be according to EN 13611:2015, 6.6.3.2 with the following modification:

For TTB and TCF-subassemblies declared as class B, EN 13611:2015, 6.6.3.2 c) is not applicable.