



BSI Standards Publication

Automatic electrical controls

Part 2-5: Particular requirements for automatic electrical burner control systems

National foreword

This British Standard is the UK implementation of EN 60730-2-5:2015+A1:2019. It is derived from IEC 60730-2-5:2013, incorporating amendment 1:2017. It supersedes BS EN 60730-2-5:2015, which will be withdrawn on 12 April 2022.

The CENELEC common modifications have been implemented at the appropriate places in the text. The start and finish of each common modification is indicated in the text by tags **[C]** **[C]**.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by **[A1]** **[A1]**.

The UK participation in its preparation was entrusted to Technical Committee CPL/72, Electrical control devices for household equipment and appliances.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Date	Text affected
31 May 2019	Implementation of IEC amendment 1:2017 with CENELEC endorsement A1:2019

English Version

Automatic electrical controls - Part 2-5: Particular requirements for automatic electrical burner control systems

Dispositifs de commande électrique automatiques - Partie
2-5: Exigences particulières pour les systèmes de
commande électrique automatiques des brûleurs

Automatische elektrische Regel- und Steuergeräte - Teil 2-
5: Besondere Anforderungen an automatische elektrische
Brenner-Steuerungs- und Überwachungssysteme

This European Standard was approved by CENELEC on 2014-11-17. CENELEC 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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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN 60730-2-5:2015) consists of the text of IEC 60730-2-5:2013 prepared by IEC/TC 72 "Automatic electrical controls", together with the common modifications prepared by CLC/TC 72 "Automatic controls for household use".

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2015-08-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-11-17

This document supersedes EN 60730-2-5:2002.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

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

This standard covers the Principle Elements of the Safety Objectives for Electrical Equipment Designed for Use within Certain Voltage Limits (LVD - 2006/95/EC).

Endorsement notice

The text of the International Standard IEC 60730-2-5:2013 was approved by CENELEC as a European Standard with agreed common modifications.

Foreword to amendment A1

The text of document 72/1084/FDIS, future IEC 60730-2-5/A1, prepared by IEC/TC 72 "Automatic electrical controls" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60730-2-5:2015/A1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2019-10-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-12

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 60730-2-5:2013/A1:2017 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60947 (series)	NOTE	Harmonized as EN 60947 (series)
IEC 62282-3-100	NOTE	Harmonized as EN 62282-3-100

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

This annex of EN 60730-1:2011 is applicable except as follows:

Addition:

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-6	-	Environmental testing Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 61643-11	-	Low-voltage surge protective devices Part 11: Surge protective devices connected to low-voltage power systems - Requirements and test methods	EN 61643-11	-
IEC 60079-20-1	2010	Explosive atmospheres - Part 20-1: Material characteristics for gas and vapour classification - Test methods and data	EN 60079-20-1	2010
ISO 23551-6	2014	Safety and control devices for gas burners and gas-burning appliances - Particular requirements - Part 6: Thermoelectric flame supervision controls	-	-

Replacement:

IEC 60127-1	2006	Miniature fuses - Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links	EN 60127-1	2006
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Annex ZB
(normative)

Special national conditions

This annex of EN 60730-1:2011 is applicable.

There are no special conditions (snc) causing a deviation from this European Standard other than those listed in Annex ZB to EN 60730-1:2011.

Annex ZC
(informative)

A-deviations

This annex of EN 60730-1:2011 is applicable except as follows:

Addition:

Clause	Deviation
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Annex H	Austria: Bundesgesetzblatt 19. Verordnung: Luftreinhalteverordnung 1989 (LVR-K 1989, air clean keeping decree for vessel equipment), last valid modification Nov. 4, 1997 by 324. Verordnung: Änderung der Luftreinhalteverordnung für Kesselanlagen 1989 (modification of LVR-K 1989, air clean keeping decree for vessel equipment):
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§ 8(1) Werden Dampfkesselanlagen mit Brennern ausgerüstet, die in den Anwendungsbereich nachstehender ÖNORMen fallen, so sind diese ÖNORMen verbindlich anzuwenden:

(Whenever steam boilers are equipped with burners concerned by the following standards, these standards have to be applied:)

- ÖNORM EN 267/1991: Atomizing oil burners of monobloc type-Testing;
- ÖNORM M 7540-1/1994: Atomizing oil burners of monobloc type for the heating fuels "fuel oil light", "fuel oil medium" and "fuel oil heavy" - Terminology, requirements, testing, marking of conformity;
- ÖNORM M 7445/1984: Forced-air gasburners;
- ÖNORM M 7445/1990: Fan-assisted gas burners with low NO_x-emission; nitrogen oxide measurement."

Annex ZZ
(informative)

Coverage of Essential Requirements of EU Directives

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and within its scope the standard covers all relevant essential requirements as given in Article 1 of Annex I of the EC Directive EMC (2004/108/EC).

Compliance with this standard provides one means of conformity with the specified essential requirements of the Directive concerned.

WARNING: Other requirements and other EU Directives may be applicable to the products falling within the scope of this standard.

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AUTOMATIC ELECTRICAL CONTROLS –

Part 2-5: Particular requirements for automatic electrical burner control systems

1 Scope and normative references

This clause of Part 1 is applicable except as follows:

1.1 Scope

This part of IEC 60730 applies to automatic electrical **burner control systems** for the **automatic control** of burners for oil, gas, coal or other combustibles intended to be used

- for household and similar use,
- in shops, offices, hospitals, farms and commercial and industrial applications.

This International Standard is applicable

- to a complete **burner control system**,
- to a separate **programming unit**,
- to a separate electronic high-voltage **ignition source**,
- to a separate **flame detector** and
- to a separate **high-temperature operation (HTO) detector**.

NOTE 1 Throughout this document, where it can be used unambiguously, the word "system" means "burner control system" and "systems" means "burner control systems".

NOTE 2 Throughout this document, the word "equipment" means "appliance and equipment."

This standard does not apply to thermoelectric flame supervision controls; thermoelectric flame supervision controls are covered by ISO 23551-6.

This document also applies to electrical **burner control systems** intended exclusively for industrial process applications e.g. those applications covered by ISO TC 244 (ISO 13577).

1.1.1 This document applies to the inherent safety, to the declared **operating values**, **operating times** and **operating sequences** where such are associated with burner safety and to the testing of automatic electrical **burner control systems** used in, on, or in association with, burners.

NOTE Requirements for specific **operating values**, **operating times** and **operating sequences** are given in the standards for appliances and equipment.

1.1.2 This document applies to AC or DC powered systems with a rated voltage not exceeding 660 V AC or 600 V DC.

1.1.3 This document does not take into account the **response value** of an **automatic action** of a **control**, if such a **response value** is dependent upon the method of mounting the **control** in the equipment. Where a **response value** is of significant purpose for the protection of the **user**, or surroundings, the value defined in the appropriate equipment standard or as determined by the manufacturer applies.

1.1.4 This document applies also to systems incorporating **electronic devices**, requirements for which are contained in Annex H.

1.1.5 This document applies to systems using NTC or PTC thermistors, additional requirements for which are contained in Annex J.

1.1.6 This document includes systems responsive to flame properties and temperature for HTO. A1

A1 Text deleted A1

1.2 Normative references

This clause of Part 1 is applicable except as follows:

Addition:

IEC 60068-2-6, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

A1 Text deleted A1

A1 IEC 60079-20-1:2010, *Explosive atmospheres – Part 20-1: Material characteristics for gas and vapour classification – Test methods and data* A1

A1 ISO 23551-6:2014, *Safety and control devices for gas burners and gas-burning appliances – Particular requirements – Part 6: Thermoelectric flame supervision controls* A1

A1 *Replacement:*

IEC 60127-1:2015, *Miniature fuses – Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links* A1

2 A1 Terms and definitions A1

This clause of Part 1 is applicable except as follows:

2.2 Definitions of types of control according to purpose

A1 NOTE Definition 2.2.23 is not applicable. A1

Additional definitions:

2.2.101

A1 system which includes a **programming unit**, a **flame detector** or, if applicable, an **HTO detector** and may include an **ignition source** and/or **ignition device** and which monitors the **operation** of fuel burners

Note 1 to entry: The various functions of the system may be in one or more housings. A1

2.2.102

flame detector

device which provides the **programming unit** with a signal indicating the presence or absence of flame

Note 1 to entry: It includes the **flame sensor** and may include an amplifier and a relay for signal **transmission**. The amplifier and relay may be in its own housing or combined with the **programming unit**.

2.2.103**flame sensor**

device which senses the flame and provides the input signal to the **flame detector** amplifier

Note 1 to entry: Examples are optical sensors and flame electrodes (flame rods).

2.2.104**ignition source**

electrical or electronic system component which provides energy to an **ignition device**

Note 1 to entry: It may be separated from or incorporated in the **programming unit**. Examples are ignition transformers and electronic high-voltage generators.

2.2.105**ignition device**

device mounted on or adjacent to a burner for igniting fuel at the burner

Note 1 to entry: Examples are **pilot** burners, spark electrodes and hot surface igniters.

2.2.106**programming unit**

device which controls the burner **operation** in a declared sequence from start-up to shut-down within declared timings and in response to signals from regulating, limiting and monitoring devices

2.2.107**multitry system**

system that allows more than one **valve open period** during its declared **operating sequence**

A1 2.2.108**HTO detector**

device which provides the **programming unit** with a signal indicating presence or absence of **HTO**

Note 1 to entry: It includes the **HTO-sensor** and may include an amplifier and a relay for signal **transmission**.

The amplifier and relay may be in its own housing or combined with the **programming unit**.

2.2.109**HTO-sensor**

device which senses the temperature of a surface or a medium within the combustion chamber which is in direct contact with a flammable fuel-air mixture and provides a signal indicating presence or absence of **HTO**

2.2.110**auto-ignition temperature****AIT**

lowest temperature (of a hot surface or the environment) at which an ignition of a flammable fuel/air mixture occurs

[SOURCE: IEC 60079-20-1:2010,3.3, modified : "or the environment" has been added in the parenthesis, "at which under specified test conditions" has been deleted and " flammable gas or vapour in mixture with air or air/ inert gas" has been replaced by " flammable fuel/air mixture"]

2.2.111**high-temperature operation****HTO**

operation on the basis of **auto-ignition temperature** which assures ignition and burning of fuel

Note 1 to entry: **High-temperature operation** is used e.g. in fuel cells (IEC 62282-3-100) and in industrial furnaces and associated processing equipment (ISO 13577) where ignition and burning is detected by means of sensing the temperature. 

2.3 Definitions relating to the function of controls

2.3.30

$T_{\max}$

Replace "switch head" by "burner control system."

2.3.32

safety shut-down

Replacement:

de-energization of the main fuel flow means as the result of the action of a limiter, a cut-out or the detection of an internal **fault** of the system

Note 1 to entry: **Safety shut-down** may include additional actions by the system. 

Additional definitions:

2.3.101

automatic recycle

automatic repetition of the start-up procedure, without manual intervention, following loss of the supervised flame and subsequent fuel supply shutoff

2.3.102

controlled shut-down

de-energization of the fuel flow means as a result of the opening of a control loop by a control device such as a **thermostat** leading the system to return to the **start position**

Note 1 to entry: **Controlled shut-down** may include additional actions by the system.

2.3.103

flame detector response time

period of time between the loss of the sensed flame and the signal indicating the absence of flame

2.3.104

flame detector operating characteristics

that function of the **flame detector** which indicates absence or presence of flame as the output signal of the **flame detector** relating to the input signal

Note 1 to entry: Normally the input signal is provided by a **flame sensor**.

2.3.104.1

signal for presence of flame

S_1

minimum signal which indicates the presence of flame when there was previously no flame

2.3.104.2

signal for absence of flame

S_2

maximum signal which indicates the loss of flame

Note 1 to entry: S_2 is less than S_1 .

2.3.104.3

maximum flame signal

$S_{\max}$

maximum signal which does not affect the timings or the sequence

2.3.104.4**signal for visible light flame simulation****S₃**

minimum signal which indicates the presence of flame during the visible light **flame simulation** test

Note 1 to entry: **S₃** is less than **S₂**.

2.3.105**self-checking flame detector**

flame detector which checks for correct **operation** of the **flame detector** and its associated electronic circuitry while the burner is in the **running position**

2.3.106**flame detector self-checking rate**

frequency of the self-checking function of the **flame detector** (in number of **operations** per unit of time)

2.3.107**flame failure lock-out time****A₁ flame failure response time A₁**

period of time between the signal indicating absence of flame and **lock-out**

2.3.108**flame failure re-ignition time****relight time**

period of time between the signal indicating absence of flame and the signal to energize the **ignition device**, during which the fuel supply is not shut off

2.3.109**flame signal**

output signal of the **flame detector**

2.3.110**flame simulation**

condition which occurs when the **flame detector** indicates the presence of flame when in reality no flame is present

2.3.111**ignition time**

period of time during which the **ignition device** is energized

2.3.112**lock-out**

process in which the system goes into one of the following **lock-out** conditions, following **safety shut-down**

2.3.112.1**non-volatile lock-out**

condition such that a restart can only be accomplished by a manual **reset** of the system and by no other cause

2.3.112.2**volatile lock-out**

condition such that a restart can be accomplished by either a manual **reset** of the system or by an interruption of the power supply and its subsequent restoration

2.3.113

main flame establishing period

period of time between the signal to energize the main fuel flow means and the signal indicating presence of the main burner flame

2.3.114

pilot flame establishing period

period of time between the signal to energize the **pilot** fuel flow means and the signal indicating presence of the **pilot** flame

2.3.115

post-ignition time

period of the **ignition time** between the signal indicating presence of flame and the signal to de-energize the **ignition device**

2.3.116

pre-ignition time

period of the **ignition time** between the signal to ignite and the signal to energize the fuel flow means

2.3.117

proved igniter

proved igniter system

system in which the fuel flow means is energized only after the availability of sufficient energy to ignite the fuel has been verified

Note 1 to entry: Examples are systems using spark supervision and those using proved hot surface igniters.

2.3.117.1

proved igniter operating value

signal which indicates that the **proved igniter** has the energy to ignite the fuel

2.3.117.2

igniter proving time

period of time between the signal to energize the **proved igniter** and the signal to energize the fuel flow means

2.3.117.3

igniter failure response time

period of time between loss of the supervised **proved igniter** and the signal to de-energize the fuel flow means

2.3.118

purge time

period during which air is introduced to displace any remaining air/fuel mixtures or products of combustion from the combustion zone and flue ways

Note 1 to entry: No fuel is admitted during this period.

2.3.118.1

post-purge time

purge time that takes place immediately following the shutting off of the fuel supply

2.3.118.2

pre-purge time

purge time that takes place between **initiation** of a burner control sequence and the admission of fuel to the burner