



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+A2:2021. It is identical to IEC 60730-2-5:2013, incorporating amendments 1:2017 and 2:2021 and corrigendum October 2023. It supersedes BS EN 60730-2-5:2015+A1:2019, which will be withdrawn on 4 March 2024.

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 1 is indicated by **[A₁]** **[A₁]**.

The start and finish of text introduced or altered by corrigendum is indicated in the text by tags. Text altered by IEC corrigendum October 2023 is indicated in the text by **[AC₁]** **[AC₁]**.

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 committee manager.

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For the Great Britain market (England, Scotland and Wales), if UK Government has designated this publication for conformity with UKCA marking (or similar) legislation, it may contain an additional National Annex. Where such a National Annex exists, it shows the correlation between this publication and the relevant UK legislation. If there is no National Annex of this kind, the relevant Annex ZA or ZZ in the body of the European text will indicate the relationship to UK regulation applicable in Great Britain. References to EU legislation may need to be read in accordance with the UK designation and the applicable UK law.

Further information on designated standards can be found at www.bsigroup.com/standardsandregulation.

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UK Government is responsible for legislation. For information on legislation and policies relating to that legislation, consult the relevant pages of www.gov.uk.

© The British Standards Institution 2024
Published by BSI Standards Limited 2024

ISBN 978 0 539 29863 5

ICS 97.120

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 April 2015.

Amendments/corrigenda issued since publication

Date	Text affected
31 May 2019	Implementation of IEC amendment 1:2017 with CENELEC endorsement A1:2019
31 March 2021	Implementation of IEC amendment 2:2021 with CENELEC endorsement A2:2021
29 February 2024	Implementation of IEC corrigendum October 2023

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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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 CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

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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

Foreword to amendment A2

The text of document 72/1259/FDIS, future IEC 60730-2-5/A2, 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/A2:2021.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2021-12-04 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2024-03-04 document have to be withdrawn

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Endorsement notice

The text of the International Standard IEC 60730-2-5:2013/A2:2021 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 60730-2-6	NOTE	Harmonized as EN 60730-2-6
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Endorsement notice to Corrigendum October 2023

The text of the corrigendum IEC 60730-2-5:2013/COR1:2023 was approved by CENELEC as EN 60730-2-5:2015/AC:2023-12 without any modification.

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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INTERNATIONAL ELECTROTECHNICAL COMMISSION

AUTOMATIC ELECTRICAL CONTROLS –**Part 2-5: Particular requirements for automatic
electrical burner control systems**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 60730-2-5 has been prepared by IEC technical committee 72: Automatic electrical controls.

The text of this standard is based on the following documents:

FDIS	Report on voting
72/922/FDIS	72/929/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This part 2-5 is intended to be used in conjunction with IEC 60730-1. ^{A2} It was established on the basis of the fifth edition:2013, including Amendment 1:201 and Amendment 2:2020 of that publication. ^{A2} Consideration may be given to future editions of, or amendments to, IEC 60730-1.

^{A2} Text deleted ^{A2}

This part 2-5 supplements or modifies the corresponding clauses in IEC 60730-1 so as to convert that publication into the IEC standard: Safety requirements for automatic electrical burner control systems.

Where this part 2-5 states "addition", "modification", or "replacement", the relevant requirement, test specification or explanatory matter in Part 1 should be adapted accordingly.

Where no change is necessary, this part 2-5 indicates that the relevant clause or subclause applies.

In the development of a fully international standard, it has been necessary to take into consideration the differing requirements resulting from practical experience in various parts of the world and to recognize the variation in national electrical systems and wiring rules.

The "in some countries" notes regarding differing national practices are contained in the following subclauses:

- 2.3.127
- 6.11
- 15.7
- 17.16.102.1
- ^{A2} H.26.11.101 ^{A2}
- ^{A2} Table H.24, Note i ^{A2}

In this publication:

- 1) The following print types are used:
 - Requirements proper: in roman type;
 - *Test specifications: in italic type;*
 - Explanatory matter; in small roman type;
 - Words defined in Clause 2: **bold**.
- 2) Subclauses, notes, tables and figures which are additional to those in Part 1 are numbered starting from 101, *additional* annexes are lettered AA, BB, etc.

A list of all parts of the IEC 60730 series, under the general title *Automatic electrical controls* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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

 Replacement: 

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**,
- to a separate **high-temperature operation (HTO) detector** and
-  • to a **burner control system** intended to be used in warm air heating appliances (furnaces) where the appliance is equipped with an electromechanical differential pressure control to monitor the difference of the combustion air pressure (Type 2.AL). This pressure control provides a switch as an alternative to one of the two switching elements to directly deenergize the safety relevant terminals. 

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).

-  This document applies to controls powered by primary or secondary batteries, requirements for which are contained within the standard, including Annex V. 

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 Text deleted **A1**

A2 **1.1.7** This document applies to the electrical and functional safety of controls capable of receiving and responding to communications signals. The signals may be transmitted to or received from external units, connected wired or wireless, that may or may not be part of the burner control system.

1.1.8 This document does not address the integrity of the output signal to the network devices, such as interoperability with other devices, unless it has been evaluated as part of the control system. **A2**

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

A2 **2.2.23** Not applicable. **A2**

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. 

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**

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