



**NSAI**  
Standards

Irish Standard  
I.S. 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 (MOD))

## I.S. EN 60730-2-9:2010

*Incorporating amendments/corrigenda issued since publication:*

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard – national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation - recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

<i>This document replaces:</i> EN 60730-2-9:2002 + A1:2003 + A2:2005 + A11:2003 + A12:2004	<i>This document is based on:</i> EN 60730-2-9:2010	<i>Published:</i> 5 November, 2010
This document was published under the authority of the NSAI and comes into effect on:  22 November, 2010		ICS number: 97.120
<b>NSAI</b> 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie  W <b>NSAI.ie</b>	<b>Sales:</b> T +353 1 857 6730 F +353 1 857 6729 W standards.ie
Údarás um Chaighdeáin Náisiúnta na hÉireann		

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60730-2-9**

November 2010

ICS 97.120

Supersedes EN 60730-2-9:2002 + A1:2003 + A2:2005 + A11:2003 + A12:2004

English version

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

Dispositifs de commande électrique  
automatiques à usage domestique et  
analogue -  
Partie 2-9: Règles particulières pour les  
dispositifs de commande thermosensibles  
(CEI 60730-2-9:2008, modifiée)

Automatische elektrische Regel- und  
Steuergeräte für den Hausgebrauch und  
ähnliche Anwendungen -  
Teil 2-9: Besondere Anforderungen an  
temperaturabhängige Regel- und  
Steuergeräte  
(IEC 60730-2-9:2008, modifiziert)

This European Standard was approved by CENELEC on 2010-11-01. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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 Central Secretariat 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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

**CENELEC**

European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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

## Foreword

The text of the International Standard IEC 60730-2-9:2008, prepared by IEC TC 72, Automatic controls for household use, together with the common modifications prepared by the Technical Committee CENELEC TC 72, Automatic controls for household use, was submitted to the CENELEC Unique Acceptance Procedure.

A draft amendment was prepared by the Technical Committee CENELEC TC 72, Automatic controls for household use. It was submitted to the Unique Acceptance Procedure.

The combined texts were approved by CENELEC as EN 60730-2-9 on 2010-11-01.

This document supersedes EN 60730-2-9:2002 + A1:2003 + A2:2005 + A11:2003 + A12:2004.

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

The following dates were fixed:

- latest date by which the EN has to be implemented  
at national level by publication of an identical  
national standard or by endorsement (dop) 2011-11-01
- latest date by which the national standards conflicting  
with the EN have to be withdrawn (dow) 2013-11-01

This Part 2-9 is to be used in conjunction with EN 60730-1:2000, *Automatic electrical controls for household and similar use – Part 1: General requirements*, and any subsequent amendments.

This European Standard has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association and covers essential requirements of EC Directive 2004/108/EC. See Annex ZZ.

Annexes ZA and ZZ have been added by CENELEC.

---

## Endorsement notice

The text of the International Standard IEC 60730-2-9:2008 was approved by CENELEC as a European Standard with agreed common modifications as given below.

### COMMON MODIFICATIONS

## 1 1 Scope and normative references

### 1.5 Normative references

**Add** the following as the first reference:

EN 60216-1, Electrical insulating materials – Properties of thermal endurance – Part 1: Ageing procedures and evaluation of test results (IEC 60216-1)

## 2 2 Definitions

**Add** the following definition:

### 2.2.101.2

#### **non-bimetallic single operation device**

single operation device having a temperature sensing element which is part of a combination action control, the operation of which cannot be separated from other functions of the control and having a non-bimetallic thermal element that operates only once and then requires complete or partial replacement

NOTE 1 When such parts can be tested separately, they are considered to be thermal links within the scope of EN 60691.

NOTE 2 The ageing period and thermal response of the device is dependent on the intended use of the device. As a result, the nature of the testing applicable to the device should be representative of the application conditions for which the protective control is intended (see 7.2).

NOTE 3 Non-bimetallic single operation devices provide the equivalent of micro-disconnection.

**2.2.101.2.2 Delete** this definition.

**2.2.101.2.3 Delete** this definition.

## 4 General notes on test

**4.1.101 Delete** the note.

**4.2.1 Addition:**

**Replace** the text with:

Six samples of bimetallic SODs are used for the test of Clause 15 and a further six for the test of Clause 17.

## 6 Classification

**6.4.3.105 Replace** with:

- an action which cannot be reset under electrically loaded conditions and at temperatures above -20 °C or at a lower temperature if so declared (Type 1.AK or 2.AK);

### 6.7 According to ambient temperature limits of the switch head

## CONTENTS

FOREWORD.....	4
1 Scope and normative references.....	7
2 Definitions .....	8
3 General requirements .....	10
4 General notes on tests.....	10
5 Rating.....	10
6 Classification .....	10
7 Information .....	11
8 Protection against electric shock.....	13
9 Provision for protective earthing.....	13
10 Terminals and terminations.....	13
11 Constructional requirements .....	13
12 Moisture and dust resistance .....	16
13 Electric strength and insulation resistance.....	17
14 Heating.....	17
15 Manufacturing deviation and drift .....	18
16 Environmental stress .....	19
17 Endurance .....	19
18 Mechanical strength.....	24
19 Threaded parts and connections .....	25
20 Creepage distances, clearances and distances through solid insulation.....	25
21 Fire hazard testing .....	25
22 Resistance to corrosion .....	25
23 Electromagnetic compatibility (EMC) requirements – emission .....	26
24 Components .....	26
25 Normal operation .....	26
26 Electromagnetic compatibility (EMC) requirements – immunity .....	26
27 Abnormal operation.....	27
28 Guidance on the use of electronic disconnection .....	27
Annexes.....	28
Annex H (normative) Requirements for electronic controls.....	28
Annex J (normative) Requirements for controls using thermistors .....	33
Annex AA (informative) Maximum manufacturing deviation and drift.....	34
Annex BB (informative) Time factor.....	35
Annex CC (informative) Number of cycles .....	38
Annex DD (normative) Controls for use in agricultural confinement buildings .....	39
Annex EE (informative) Guide to the application of temperature sensing controls within the scope of IEC 60730-2-9.....	43
Figure 11.4.13.102 – Impact tool .....	14
Figure 17.101.3 – Aluminium cylinder for temperature change method.....	23

**I.S. EN 60730-2-9:2010**

60730-2-9 © IEC:2008

– 3 –

Figure BB.1 – Determination of time factor in the case of a sudden temperature change .....	36
Figure BB.2 – Determination of time factor in the case of a linear rise of test-bath temperature .....	37
Figure EE.1 – Thermostat .....	52
Figure EE.2 – Self-resetting temperature limiter.....	53
Figure EE.3 – Non-self-resetting temperature limiter.....	53
Figure EE.4 – Self-resetting thermal cut-out .....	55
Figure EE.5 – Manual reset thermal cut-out.....	55
Figure EE.6 – Single operation device .....	57
Figure EE.7 – Three-stage control system .....	58
Table H.26.2.101 – Compliance criteria .....	30
Table BB.1 – Method to determine and verify time factor values (see 11.101) .....	37
Table EE.1 – Typical examples of the classification of temperature sensing controls in accordance with IEC 60730-2-9.....	59

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

### **AUTOMATIC ELECTRICAL CONTROLS FOR HOUSEHOLD AND SIMILAR USE –**

#### **Part 2-9: Particular requirements for temperature sensing controls**

#### 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60730-2-9 has been prepared by IEC technical committee 72: Automatic controls for household use.

This third edition cancels and replaces the second edition published in 2000, its Amendment 1 (2002) and Amendment 2 (2004) and constitutes a technical revision.

This edition of IEC 60730-2-9 contains a new Annex EE, which is an informative guide to the application of temperature sensing controls. Additionally, a new requirement to 17.3.1 (there is an error in the FDIS document - 17.7.3 should be 17.3.1) was added to address the endurance requirement for temperature sensing devices where the whole control is declared as the sensing element for ambient temperatures below 0° C. This document contains also some editorial changes due to new editions of referenced standards.



**I.S. EN 60730-2-9:2010**

60730-2-9 © IEC:2008

– 5 –

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

FDIS	Report on voting
72/763/FDIS	72/767/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 ISO/IEC Directives, Part 2.

This Part 2-9 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the third edition of that standard (1999) and its Amendment 1 (2003) and Amendment 2 (2007). Consideration may be given to future editions of, or amendments to, IEC 60730-1.

This Part 2-9 supplements or modifies the corresponding clauses in IEC 60730-1, so as to convert that publication into the IEC standard: Particular requirements for temperature sensing controls.

Where this Part 2-9 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 2-9 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 practice are contained in the following subclauses:

- 4.1.101
- Table 7.2, note 102
- 11.4.3.101
- 11.4.101
- 11.101
- 12.101.3
- 13.2
- 17.8.4.101
- 17.15.1.3
- 17.15.1.3.1
- 17.16.101
- 17.16.105
- 18.102.3
- 23.101
- Annex AA
- CC.2
- DD.9.2
- EE.3.6

In this publication, the following print types are used:

- Requirements proper: in roman type.
- *Test specifications: in italic type.*
- Explanatory matter: in smaller roman type.

Subclauses, notes or items 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 for household and similar use*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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 FOR HOUSEHOLD AND SIMILAR USE –**

### **Part 2-9: Particular requirements for temperature sensing controls**

#### **1 Scope and normative references**

This clause of Part 1 is applicable except as follows:

##### **1.1 Replacement:**

This part of IEC 60730 applies to automatic electrical temperature sensing controls for use in, on or in association with equipment for household and similar use, including electrical controls for heating, air-conditioning and similar applications. The equipment may use electricity, gas, oil, solid fuel, solar thermal energy, etc., or a combination thereof.

##### **1.1.1 Replace the explanatory matter with the following new explanatory matter:**

Examples of such controls include boiler thermostats, fan controls, temperature limiters and thermal cut-outs.

Throughout this standard, the word "equipment" includes "appliance" and "control system".

##### **1.1.2 Replacement:**

This standard also applies to the electrical safety of temperature sensing controls with non-electrical outputs such as refrigerant flow and gas controls.

##### **1.1.3 Not applicable.**

##### **Additional subclause:**

**1.1.101** This standard applies to single operation devices as defined in this standard.

#### **1.5 Normative references**

##### **Addition:**

IEC 60335 (all parts), *Household and similar electrical appliances – Safety*

IEC 60691:2002, *Thermal links – Requirements and application guide*  
Amendment 1 (2006)

IEC 60730-2-4, *Automatic electrical controls for household and similar use – Part 2-4:  
Particular requirements for thermal motor protectors for motor-compressors of hermetic and  
semi-hermetic type*

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- Looking for additional Standards? Visit Intertek Inform Infostore
  - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-