Automatic electrical controls - Part 2-23: Particular requirements for electrical sensors and sensing elements

EESTI STANDARDIMIS- JA AKREDITEERIMISKESKUS
ESTONIAN CENTRE FOR STANDARDISATION AND ACCREDITATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60730-2-23:2025 sisaldab Euroopa standardi EN IEC 60730-2-23:2025 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60730-2-23:2025 consists of the English text of the European standard EN IEC 60730-2-23:2025.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 27.06.2025.	Date of Availability of the European standard is 27.06.2025.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Automatic electrical controls - Part 2-23: Particular requirements for electrical sensors and sensing elements (IEC 60730-2-23:2025)

Dispositifs de commande électrique automatiques - Partie 2-23: Exigences particulières pour les capteurs électriques et les éléments sensibles (IEC 60730-2-23:2025)

Automatische elektrische Regel- und Steuergeräte - Teil 2-23: Besondere Anforderungen an elektrische Sensoren und Sensorelemente (IEC 60730-2-23:2025)

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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

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European foreword

The text of document 72/1477/FDIS, future edition 1 of IEC 60730-2-23, prepared by TC 72 "Automatic electrical controls" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60730-2-23:2025.

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)	2026-06-30
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2028-06-30

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Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 60730-2-23:2025 was approved by CENELEC as a European Standard without any modification.

IEC 60730-2-23

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Automatic electrical controls – Part 2-23: Particular requirements for electrical sensors and sensing elements

Dispositifs de commande électrique automatiques – Partie 2-23: Exigences particulières pour les capteurs électriques et les éléments sensibles

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IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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AUTOMATIC ELECTRICAL CONTROLS –

Part 2-23: Particular requirements for electrical sensors and sensing elements

FOREWORD

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IEC 60730-2-23 has been prepared by IEC technical Committee 72: Automatic electrical controls. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
72/1477/FDIS	72/1481/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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

This part 2-23 is intended to be used in conjunction with IEC 60730-1. It was established on the basis of the publication of the sixth edition of IEC 60730-1:2022.

This part 2-23 supplements or modifies the corresponding clauses in 60730-1:2022, so as to convert that publication into the IEC standards: Safety requirements for electrical sensors and sensing elements.

When a particular subclause of Part 1 is not mentioned in this Part 2, that subclause applies.

Where no change is necessary, this part 2-23 indicates that the relevant clause or subclass in IEC 60730-1 applies.

In this publication:

1) The following print types are used:
   – *test specifications: in italic type;*
2) Subclauses, notes or items which are additional to those in Part 1 are numbered starting from 101, additional annexes are lettered AA, BB, etc.
3) Words in **bold** in the text are defined in Clause 3.

Sensor manufacturers may refer to this Part 2 as a template to understand how to apply the relevant clauses in IEC 60730-1 and to begin designing sensors and sensing elements and apply these requirements for their devices.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

AUTOMATIC ELECTRICAL CONTROLS –

Part 2-23: Particular requirements for electrical sensors and sensing elements

1 Scope

This clause of Part 1 is applicable except as follows.

Replacement:

This part of IEC 60730 applies to the safety of electrical, electro-mechanical and electronic **sensors** including **sensing elements** and any conditioning circuitry. **Sensors** covered under the scope of this document serve only to transform an activating quantity into a usable output and do not perform a control **operation** as defined in IEC 60730-1.

This document applies to **sensors** in so far as defining the reliability and accuracy of their inherent operating characteristics and corresponding response under normal and abnormal conditions within the **sensor**. **Sensors**, as defined herein, are used in or as part of an automatic electrical control or as independently mounted devices in connection with controls and control systems.

The use of this document for other applications in which **sensors** are used is possible provided that the appropriate safety is maintained as defined by the end product standard. This document applies to discrete **sensors** constructed of, but not limited to, conductive or semiconductive substrate, for the detection of activating quantities such as voltage, current, temperature, pressure, **humidity**, light (e.g. optical), gasoline vapours, and the like.

NOTE 1 Future consideration will be given to other **sensor** technologies such as chemical, mechanical and micro-electromechanical systems (MEMS), along with other activating quantities like mass flow, liquid, movement, weight, vibration, or other as needed.

This document applies to **sensing element**(**s**) as well as any electronic hardware, software, or other conditioning circuits that are inherent to the **sensor** and relied upon to reliably transform the input **signal** into a useable response **signal** (output) for functional safety purposes. Conditioning circuits that are inseparable from the control for which the **sensing element** relies upon to perform its desired function are evaluated by the requirements of the relevant control Part 2 standard and/or IEC 60730-1.

NOTE 2 Additional requirements can be also applied by the application standard in which the **sensor** is used.

Throughout this document, whenever it is indicated that the IEC 60730-1 requirements are applicable, the term "control(s)", is replaced by the term "**sensor**(**s**)", and the term "equipment" is replaced by the term "control", as they are used in IEC 60730-1, respectively, unless otherwise specified herein.

This document does not apply to **sensors** explicitly described in another relevant part 2 of the IEC 60730 series.

NOTE 3 For example, a flame **sensor** as described in IEC 60730-2-5.

2 Normative references

This clause of Part 1 is applicable except as follows.

Addition:

IEC 60730-1:2022, *Automatic electrical controls – Part 1: General requirements*

IEC 60751:2022, *Industrial platinum resistance thermometers and platinum temperature sensors*

3 Terms and definitions

This clause of Part 1 is applicable except as follows.

3.1 Definitions relating to ratings, voltages, currents, frequencies, and wattages

Additional definition:

3.1.101
signal
physical variable quantity one or more parameters of which carry information about one or more variable quantities

Note 1 to entry: These parameters are designated "information parameters".

Note 2 to entry: This entry was numbered 351-21-51 in IEC 60050-351:2006.

[SOURCE: IEC 60050-351:2013, 351-41-17]

3.2 Definitions of types of control according to purpose

Additional definitions:

3.2.101
sensor
device that embodies a **sensing element**, which is directly affected by the activating quantity, and which generates a **signal** related to the value of the activating quantity and can also include an auxiliary **sensor** circuit, and/or **signal** conditioner

Note 1 to entry: When the term "**sensor**" is used throughout this document in a general way, it refers to all types of **sensors** unless otherwise noted. See example in Figure 101.