IEC 60730-2-23

Edition 1.0 2025-05
EXTENDED VERSION

INTERNATIONAL STANDARD

This full version of IEC 60730-2-23:2025 includes the content of the references made to IEC 60730-1:2022

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

ICS 97.120

ISBN 978-2-8327-0437-0

IEC 60730-2-23:2025-05 EXV(en)

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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AUTOMATIC ELECTRICAL CONTROLS –

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

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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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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This extended version (EXV) of the official IEC Standard provides the user with the full content of the Standard.

IEC 60730-2-23:2025 EXV includes the content of IEC 60730-2-23:2025, and the references made to IEC 60730-1:2022.

The specific content of IEC 60730-2-23:2025 is displayed on a blue background.

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 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

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60038, *IEC standard voltages*

IEC 60065:2014, *Audio, video and similar electronic apparatus – Safety requirements*

IEC 60068-2-75, *Environmental testing – Part 2-75: Tests – Test Eh: Hammer tests*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IEC 60099-1:1991, *Surge arresters – Part 1: Non-linear resistor type gapped surge arresters for a.c. systems*[1]

IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60127 (all parts), *Miniature fuses*

IEC 60227-1, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 1: General requirements*

IEC 60245-1, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 1: General requirements*

IEC 60269 (all parts), *Low-voltage fuses*

IEC 60335-1:2020, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60384-14, *Fixed capacitors for use in electronic equipment – Part 14: Sectional specification – Fixed capacitors for electromagnetic interference suppression and connection to the supply mains*

IEC 60384-16, *Fixed capacitors for use in electronic equipment – Part 16: Sectional specification – Fixed metallized polypropylene film dielectric DC capacitors*

IEC 60384-17, *Fixed capacitors for use in electronic equipment – Part 17: Sectional specification – Fixed metallized polypropylene film dielectric AC and pulse capacitors*

IEC 60417, *Graphical symbols for use on equipment*

IEC 60423, *Conduit systems for cable management – Outside diameters of conduits for electrical installations and threads for conduits and fittings*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60539 (all parts), *Directly heated negative temperature coefficient thermistors*

IEC 60664-1:2007[2], *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC TR 60664-2 (all parts), *Insulation coordination for equipment within low-voltage systems*

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1 Withdrawn.

2 Withdrawn.

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 60695-2-10, *Fire hazard testing – Part 2-10: Glowing/hot-wire based test methods – Glow-wire apparatus and common test procedure*

IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end-products (GWEPT)*

IEC 60695-10-2, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

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

IEC 60738 (all parts), *Thermistors – Directly heated positive temperature coefficient*

IEC 60747-5-5, *Semiconductor devices – Part 5-5: Optoelectronic devices – Photocouplers*

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

IEC 60884-1, *Plugs and socket-outlets for household and similar purposes – Part 1: General requirements*

IEC 60884-2-5:2017, *Plugs and socket-outlets for household and similar purposes – Part 2-5: Particular requirements for adaptors*

IEC 60998-2-2, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-2: Particular requirements for connecting devices as separate entities with screwless-type clamping units*

IEC 60998-2-3, *Connecting devices for low-voltage circuits for household and similar purposes – Part 2-3: Particular requirements for connecting devices as separate entities with insulation-piercing clamping units*

IEC 60999-1, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm^2 up to 35 mm^2 (included)*

IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤16 A per phase and not subject to conditional connection*

IEC 61000-3-11, *Electromagnetic compatibility (EMC) – Part 3-11: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems – Equipment with rated current ≤ 75 A and subject to conditional connection*

IEC 61000-3-12, *Electromagnetic compatibility (EMC) – Part 3-12: Limits – Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

IEC 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*
IEC 61000-4-5:2014/AMD1:2017

IEC 61000-4-6, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

IEC 61000-4-8, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with current up to 16 A per phase*

IEC 61000-4-13:2002, *Electromagnetic compatibility (EMC) – Part 4-13: Testing and measurement techniques – Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*
IEC 61000-4-13:2002 /AMD1:2009
IEC 61000-4-13:2002 /AMD2:2015

IEC 61000-4-20, *Electromagnetic compatibility (EMC) – Part 4-20: Testing and measurement techniques – Emission and immunity testing in transverse electromagnetic (TEM) waveguides*

IEC 61000-4-21, *Electromagnetic compatibility (EMC) – Part 4-21: Testing and measurement techniques – Reverberation chamber test methods*

IEC 61000-4-22, *Electromagnetic compatibility (EMC) – Part 4-22: Testing and measurement techniques – Radiated emissions and immunity measurements in fully anechoic rooms (FARs)*

IEC 61000-4-28, *Electromagnetic compatibility (EMC) – Part 4-28: Testing and measurement techniques – Variation of power frequency, immunity test for equipment with input current not exceeding 16A per phase*

IEC 61000-6-1:2016, *Electromagnetic compatibility (EMC) – Part 6-1: Generic standards – Immunity standard for residential, commercial and light-industrial environments*

IEC 61000-6-2:2016, *Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments*

IEC 61000-6-3:2020, *Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for equipment in residential environments*

IEC 61000-6-4:2018, *Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments*

IEC 61051-1, *Varistors for use in electronic equipment – Part 1: Generic specification*

IEC 61051-2, *Varistors for use in electronic equipment – Part 2: Sectional specification for surge suppression varistors*

IEC 61051-2-2, *Varistors for use in electronic equipment – Part 2: Blank detail specification for zinc oxide surge suppression varistors. Assessment level E*

IEC 61210, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61249 (all parts), *Materials for printed boards and other interconnecting structures*

IEC 61558-2-6, *Safety of transformers, reactors, power supply units and combinations thereof − Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers for general applications*

IEC 61558-2-16, *Safety of transformers, reactors, power supply units and combinations thereof − Part 2-16: Particular requirements and tests for switch mode power supply units and transformers for switch mode power supply units for general applications*

IEC 61810-3, *Electromechanical elementary relays – Part 3: Replays with forcibly guided (mechanically linked) contacts*

IEC 62151, *Safety of equipment electrically connected to a telecommunication network*

IEC 62319 (all parts), *Polymeric thermistors – Directly heated positive step function temperature coefficient*

IEC 62326 (all parts), *Printed boards*

IEC 62368-1, *Audio/video, information and communication technology equipment – Part 1: Safety requirements*

IEC 63044 (all parts), *Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS)*

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

CISPR 14-1:2020, *Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus – Part 1: Emission*

CISPR 32:2015, *Electromagnetic compatibility of multimedia equipment – Emission* requirements
CISPR 32:2015/AMD1:2019

ISO 4046-4:2016, *Paper, board, pulps and related terms − Vocabulary − Part 4: Paper and board grades and converted products*

ISO 7637-2:2011, *Road vehicles – Electrical disturbances from conduction and coupling – Part 2: Electrical transient conduction along supply lines only*

ISO 7637-3:2016, *Road vehicles – Electrical disturbances from conduction and coupling – Part 3: Electrical transient transmission by capacitive and inductive coupling via lines other than supply lines*

ISO 16484 (all parts), *Building automation and control systems (BACS)*

IEC 60730-2-23

Edition 1.0 2025-05

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

ICS 97.120

ISBN 978-2-8327-0412-7

IEC 60730-2-23:2025-05(en-fr)

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

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

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   – *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.

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- 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*

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COMMISSION ÉLECTROTECHNIQUE INTERNATIONALE

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DISPOSITIFS DE COMMANDE ÉLECTRIQUE AUTOMATIQUES –

Partie 2-23: Exigences particulières pour les capteurs électriques et les éléments sensibles

AVANT-PROPOS

1) La Commission Électrotechnique Internationale (IEC) est une organisation mondiale de normalisation composée de l'ensemble des comités électrotechniques nationaux (Comités nationaux de l'IEC). L'IEC a pour objet de favoriser la coopération internationale pour toutes les questions de normalisation dans les domaines de l'électricité et de l'électronique. À cet effet, l'IEC – entre autres activités – publie des Normes internationales, des Spécifications techniques, des Rapports techniques, des Spécifications accessibles au public (PAS) et des Guides (ci-après dénommés "Publication(s) de l'IEC"). Leur élaboration est confiée à des comités d'études, aux travaux desquels tout Comité national intéressé par le sujet traité peut participer. Les organisations internationales, gouvernementales et non gouvernementales, en liaison avec l'IEC, participent également aux travaux. L'IEC collabore étroitement avec l'Organisation Internationale de Normalisation (ISO), selon des conditions fixées par accord entre les deux organisations.
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L'IEC 60730-2-23 a été établie par le comité d'études 72 de l'IEC: Commandes électriques automatiques. Il s'agit d'une Norme internationale.

Le texte de cette Norme internationale est issu des documents suivants:

Projet	Rapport de vote
72/1477/FDIS	72/1481/RVD

Le rapport de vote indiqué dans le tableau ci-dessus donne toute information sur le vote ayant abouti à son approbation.

La langue employée pour l'élaboration de cette Norme internationale est l'anglais.

Ce document a été rédigé selon les Directives ISO/IEC, Partie 2, il a été développé selon les Directives ISO/IEC, Partie 1 et les Directives ISO/IEC, Supplément IEC, disponibles sous www.iec.ch/members_experts/refdocs. Les principaux types de documents développés par l'IEC sont décrits plus en détail sous www.iec.ch/standardsdev/publications.

Une liste de toutes les parties de la série IEC 60730, publiées sous le titre général: *Dispositifs de commande électrique automatiques*, se trouve sur le site web de l'IEC.

La présente partie 2-23 est destinée à être utilisée conjointement avec l'IEC 60730-1. Elle a été établie sur la base de la publication de la sixième édition de l'IEC 60730-1:2022.

La présente partie 2-23 complète ou modifie les articles correspondants de l'IEC 60730-1:2022, de façon à transformer cette publication en norme IEC: Exigences de sécurité pour les capteurs électriques et les éléments sensibles.

Lorsqu'un paragraphe particulier de la Partie 1 n'est pas mentionné dans cette Partie 2, ce paragraphe s'applique.

Lorsqu'aucune modification n'est nécessaire, la présente partie 2-23 indique que l'article ou le paragraphe approprié de l'IEC 60730-1 s'applique.

Dans cette publication:

1) Les caractères d'imprimerie suivants sont utilisés:
   – *modalités d'essais: caractères italiques;*
2) Les paragraphes, notes ou articles qui s'ajoutent à ceux de la Partie 1 sont numérotés à partir de 101 et les annexes qui sont ajoutées sont désignées AA, BB, etc.
3) Les termes en **gras** dans le texte sont définis à l'Article 3.

Les fabricants de capteurs peuvent consulter la présente Partie 2 comme modèle pour comprendre comment appliquer les articles pertinents de l'IEC 60730-1 et pour commencer à concevoir des capteurs et des éléments sensibles et mettre en œuvre ces exigences pour leurs dispositifs.

Le comité a décidé que le contenu de ce document ne sera pas modifié avant la date de stabilité indiquée sur le site web de l'IEC sous webstore.iec.ch dans les données relatives au document recherché. À cette date, le document sera

- reconduit,
- supprimé, ou
- révisé.

DISPOSITIFS DE COMMANDE ÉLECTRIQUE AUTOMATIQUES –

Partie 2-23: Exigences particulières pour les capteurs électriques et les éléments sensibles

1 Domaine d'application

L'article de la Partie 1 s'applique, avec l'exception suivante.

Remplacement:

La présente partie de l'IEC 60730 s'applique à la sécurité des **capteurs** électriques, électromécaniques et électroniques, y compris les **éléments sensibles** et les circuits de conditionnement éventuels. Les **capteurs** couverts par le domaine d'application du présent document permettent uniquement de transformer une grandeur de manœuvre en sortie utilisable et n'effectuent aucune **opération** de commande définie dans l'IEC 60730-1.

Le présent document s'applique aux **capteurs** dans la mesure où il définit la fiabilité et l'exactitude de leurs caractéristiques de fonctionnement intrinsèques et leur réponse correspondante dans des conditions normales et anormales à l'intérieur du **capteur**. Les **capteurs** définis dans le présent document sont utilisés dans un dispositif de commande électrique automatique ou comme partie de celui-ci, ou comme des dispositifs à montage indépendant connectés à des dispositifs et systèmes de commande.

L'application du présent document dans le cadre d'autres utilisations des **capteurs** est possible sous réserve d'assurer la sécurité adéquate, selon la définition donnée dans la norme du produit final. Le présent document s'applique aux **capteurs** discrets composés notamment d'un conducteur ou d'un substrat semiconducteur, pour la détection de grandeurs de manœuvre comme la tension, le courant, la température, la pression, l'**humidité**, la lumière (optique, par exemple), les vapeurs d'essence, etc.

NOTE 1 D'autres technologies de **capteurs** seront envisagées à l'avenir comme les systèmes chimiques, mécaniques et microélectromécaniques (MEMS) ainsi que d'autres grandeurs de manœuvre comme le débit massique, le liquide, le mouvement, le poids, les vibrations, etc.

Le présent document s'applique à l'**élément** ou aux **éléments sensibles**, ainsi qu'aux matériels électroniques, logiciels ou autres circuits de conditionnement qui sont intrinsèques au **capteur** et qui permettent de transformer de manière fiable le **signal** d'entrée en un **signal** de réponse (sortie) utilisable à des fins de sécurité fonctionnelle. Les circuits de conditionnement qui sont inséparables du dispositif de commande sur lequel repose l'**élément sensible** pour accomplir sa fonction souhaitée sont évalués conformément aux exigences de la Partie 2 applicable au dispositif de commande et/ou de l'IEC 60730-1.

NOTE 2 Des exigences supplémentaires peuvent également s'appliquer au titre de la norme d'application dans laquelle le **capteur** est utilisé.

Dans l'ensemble du présent document, s'il est indiqué que les exigences de l'IEC 60730-1 s'appliquent, le terme "dispositif(s) de commande" est remplacé par le terme "**capteur**(**s**)" et le terme "équipement" est remplacé par le terme "dispositif de commande", lorsque ces termes sont respectivement utilisés dans l'IEC 60730-1, sauf spécification contraire dans le présent document.

Le présent document ne s'applique pas aux **capteurs** décrits de manière explicite dans une autre partie 2 pertinente de la série IEC 60730.

NOTE 3 Par exemple, un **capteur** de flamme décrit dans l'IEC 60730-2-5.

2 Références normatives

L'article de la Partie 1 s'applique, avec l'exception suivante.

Addition:

IEC 60730-1:2022, *Dispositifs de commande électrique automatiques – Partie 1: Exigences générales*

IEC 60751:2022, *Thermomètres à résistance de platine industriels et capteurs thermométriques de platine industriels*