SLOVENSKI STANDARD

SIST-TS CLC/TS 61496-2:2005

december 2005

Varnost strojev – Električno občutljiva zaščitna oprema – 2. del: Posebne zahteve za opremo, ki uporablja aktivne optoelektronske zaščitne elemente (IEC 61496-2:1997)

Safety of machinery – Electro-sensitive protective equipment – Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPD) (IEC 61496-2:1997)

ICS 13.110; 31.260

Referenčna številka
SIST-TS CLC/TS 61496-2:2005(en)

TECHNICAL SPECIFICATION

SPECIFICATION TECHNIQUE

TECHNISCHE SPEZIFIKATION

CLC/TS 61496-2

December 2003

ICS 31.260

English version

Safety of machinery – Electro-sensitive protective equipment Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPD)

(IEC 61496-2:1997)

Sécurité des machines –
Equipement de protection électrosensible
Partie 2: Prescriptions particulières
á un équipement utilisant des dispositifs
protecteurs optoélectroniques actifs
(AOPD)
(CEI 61496-2:1997)

Sicherheit von Maschinen –
Berührungslos wirkende
Schutzeinrichtungen
Teil 2: Besondere Anforderungen an
Einrichtungen, welche nach dem aktiven
optoelektronischen Prinzip arbeiten
(IEC 61496-2:1997)

This Technical Specification was approved by CENELEC on 2003-09-15.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. CLC/TS 61496-2:2003 E

Foreword

The text of the International Standard IEC 61496-2:1997, prepared by IEC TC 44, Safety of machinery - Electrotechnical aspects, was submitted to the formal vote and was approved by CENELEC as CLC/TS 61496-2 on 2003-09-15 without any modification.

The following date was fixed:

– latest date by which the existence of the CLC/TS has to be announced at national level (doa) 2004-03-16

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 61496-2:1997 was approved by CENELEC as a Technical Specification without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This Technical Specification incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Technical Specification only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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

Publication	Year	Title	EN/HD	Year
IEC 60825-1	1993	Safety of laser products Part 1: Equipment classification, requirements and user's guide	EN 60825-1 + corr. February	1994 1995

NORME INTERNATIONALE

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Sécurité des machines – Equipement de protection électrosensible –

Partie 2: Prescriptions particulières à un équipement utilisant des dispositifs protecteurs optoélectroniques actifs (AOPD)

Safety of machinery – Electro-sensitive protective equipment –

Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)

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International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SAFETY OF MACHINERY – ELECTRO-SENSITIVE PROTECTIVE EQUIPMENT –

Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.

3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.

4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.

5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.

6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 61496-2 has been prepared by IEC technical committee 44: Safety of machinery – Electrotechnical aspects, in collaboration with CENELEC technical committee 44X: Safety of machinery – Electrotechnical aspects

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

FDIS	Report on voting
44/208/FDIS	44/212/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.

INTRODUCTION

An electro-sensitive protective equipment (ESPE) is applied to machinery that presents a risk of personal injury. It provides protection by causing the machine to revert to a safe condition before a person can be placed in a hazardous situation.

This part of International Standard IEC 61496 provides general design and performance requirements of ESPEs for use over a broad range of applications. Essential features of equipment meeting the requirements of this standard are the appropriate level of safety-related performance provided and the built-in periodic functional checks/self-checks that are specified to ensure that this level of performance is maintained.

This part supplements or modifies the corresponding clause in IEC 61496-1.

Where a particular clause or subclause of part 1 is not mentioned in this part 2, that clause or subclause applies as far as is reasonable. Where this part states "addition", "modification" or "replacement", the relevant text of part 1 is to be adapted accordingly.

This standard has the status of a product family standard and may be used as a normative reference in a dedicated product standard for the safety of machinery.

Each type of machine presents its own particular hazards and it is not the purpose of this standard to recommend the manner of application of the ESPE to any particular machine. The application of the ESPE should be a matter for agreement between the equipment supplier, the machine user and the enforcing authority; in this context, attention is drawn to the relevant guidance established internationally, for example ISO/TR 12100.

SAFETY OF MACHINERY – ELECTRO-SENSITIVE PROTECTIVE EQUIPMENT –

Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)

1 Scope

This clause of part 1 is replaced by the following:

This part of IEC 61496 specifies requirements for the design, construction and testing of electro-sensitive protective equipment (ESPE) for the safeguarding of machinery, employing active opto-electronic protective devices (AOPDs) for the sensing function. Special attention is directed to features that ensure an appropriate safety-related performance is achieved. An ESPE may include optional safety-related functions, the requirements for which are given in annex A of part 1.

This part does not specify the dimensions or configurations of the detection zone and its disposition in relation to hazardous parts for any particular application, nor what constitutes a hazardous state of any machine. It is restricted to the functioning of the ESPE and how it interfaces with the machine.

Excluded from this part are AOPDs employing radiation at wavelengths outside the range 400 nm to 1 500 nm.

This part may be relevant to applications other than those for the protection of persons, for example the protection of machinery or products from mechanical damage. In those applications additional requirements may be necessary, for example when the materials that are to be recognized by the sensing function have different properties from those of persons.

This part does not deal with EMC emission requirements.

2 Normative references

This clause of part 1 is applicable except as follows:

Additional reference:

IEC 60825-1: 1993, *Safety of laser products – Part 1 – Equipment classification, requirements and user's guide*

3 Definitions

NOTE – The index at the end of this standard lists, in alphabetical order, the terms and acronyms defined in clause 3 and indicates where they are used in the text.

This clause of part 1 is applicable except as follows:

Additional definitions:

3.201 **active opto-electronic protective device (AOPD):** A device whose sensing function is performed by opto-electronic emitting and receiving elements detecting the interruption of optical radiations generated, within the device, by an opaque object present in the specified detection zone.

NOTE – AOPDs operate either on a through beam principle, where the light beam traverses the detection zone once, or on a retro-reflective principle, where the light beam traverses the detection zone twice.

3.202 **AOPD detection capability:** In an active opto-electronic protective device (AOPD), the dimension representing the diameter of the opaque cylinder which

– for a light curtain, will actuate the sensing device when placed in the detection zone,

– for a light beam device, will actuate the sensing device when placed in the beam on the axis of the beam.

3.203 **beam centre-line:** In an active opto-electronic protective device (AOPD), the optical path joining the optical centre of an emitting element to the optical centre of the receiving element, that is intended to respond to light from that emitting element during normal operation.

NOTES

1 The optical axis of a light beam is not always on the beam centre-line.

2 Physical displacement of the beam centre-line may occur as a consequence of normal operation (for example by the use of a motor-driven mirror).

3.204 **effective aperture angle (EAA):** The maximum angle of deviation from the optical alignment of the emitting element(s) and the receiving element(s) within which the active opto-electronic protective device (AOPD) continues in normal operation.

3.205 **light beam device:** An active opto-electronic protective device (AOPD) comprising one emitting element and one receiving element, where a detection zone is not specified by the supplier.

NOTE – An AOPD can comprise an arrangement of more than one light beam device.

3.206 **light curtain:** An active opto-electronic protective device (AOPD) comprising an integrated assembly of one or more emitting element(s) and one or more receiving element(s) forming a detection zone with a detection capability, both specified by the supplier.

3.207 **test piece:** An opaque cylindrical element used to verify the detection capability of the active opto-electronic device (AOPD).

3.208 **trip device:** A device which causes a machine or machine elements to stop (or ensures an otherwise non-hazardous condition) when a person or a part of a person is detected by the sensing function.

3.209 **trip device test piece:** A test piece used to verify the detection capability of an active opto-electronic protective device (AOPD) used as a trip device.