SIST

SLOVENSKI STANDARD
SIST EN 61496-2:2014/oprA1:2019

01-junij-2019

Varnost strojev - Električno občutljiva zaščitna oprema - 2. del: Posebne zahteve za opremo, ki uporablja aktivne optoelektronske zaščitne elemente

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

Sicherheit von Maschinen - Berührungslos wirkende Schutzeinrichtungen - Teil 2: Besondere Anforderungen an Einrichtungen, welche nach dem aktiven opto-elektronischen Prinzip arbeiten

Securité des machines - Equipements de protection électro-sensibles - Partie 2: Exigences particulières à un équipement utilisant des dispositif protecteurs optoélectroniques actifs (AOPD)

Ta slovenski standard je istoveten z: EN 61496-2:2013/prA1:2019

ICS:

13.110	Varnost strojev	Safety of machinery
31.260	Optoelektronika, laserska oprema	Optoelectronics. Laser equipment

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44/846/CDV

COMMITTEE DRAFT FOR VOTE (CDV)

PROJECT NUMBER: **IEC 61496-2/AMD1 ED3**	
DATE OF CIRCULATION: **2019-03-29**	CLOSING DATE FOR VOTING: **2019-06-21**
SUPERSEDES DOCUMENTS: **44/833/CD, 44/841A/CC**	

IEC TC 44 : SAFETY OF MACHINERY - ELECTROTECHNICAL ASPECTS	
SECRETARIAT: United Kingdom	SECRETARY: Mrs Nyomee Hla-Shwe Tun
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.

FUNCTIONS CONCERNED:

☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY

☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Amendment 1 – Safety of machinery - Electro-sensitive protective equipment – Part 2: Particular requirements for equipment using active opto-electronic protective devices (AOPDs)

PROPOSED STABILITY DATE: 2022

NOTE FROM TC/SC OFFICERS:

Please let me know if you need any further info. Many thanks.

The reasons and objectives for amending IEC 61496

The main purpose for these amendments to IEC 61496-1 and -2 is as follows:

1) To clarify that Part one of this standard defines only general requirements for non-contact electro sensitive protective equipment. Part one is intended to be used with a subsequent Part that defines particular requirements based on the sensing technology used for detection.

2) It was discovered that some additional requirements for environmental influences were repeated in parts 2, 3, 4-2 and 4-3. It was decided that these requirements were common to all ESPEs and would be appropriate to include in Part one.

3) Since this standard was written, several new generic standards have been developed that focus on specific environmental influences that can affect functional safety (e.g. EMC, temperature, vibration). Part one has been updated to harmonize with the requirements of the new generic standards, including adjusting terminology and format of tables to match the new standards. It is not intended to change the actual requirements.

4) In the original standard, some of the test procedures for environmental influences were unclear or incomplete. These procedures have been expanded to provide detailed step by step procedures. Where appropriate, references to procedures described in the generic test standards are provided.

5) There are Type 3 AOPDs on the market today. The requirements for Type 3 AOPDs are now included in Part two.

6) Some of functional safety fault protection requirements were un-realistic and were generally not possible to comply with. These requirements have been adjusted slightly.

7) Some small corrections and improvements were included throughout the document.

8) It is not intended that these amendments result in significant changes to the requirements. It is believed that most ESPEs that comply with the existing standards will still be compliant with these reorganized documents.

FOREWORD

This amendment has been prepared by IEC technical committee 44: Safety of machinery – Electrotechnical aspects.

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

FDIS	Report on voting
44/XX/FDIS	44/XX/RVD

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

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the maintenance result date[1] 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.

[1] The National Committees are requested to note that for this publication the maintenance result date is 2011.

2 Normative references

Note to reviewer: All dated references will be checked and updated before publication.

4.1.2.1 General requirements

Replace clause 4.1.2.1 with the following text:

The sensing function shall be effective over the detection zone specified by the supplier. No adjustment of the detection zone, detection capability or blanking function shall be possible without the use of a key, key-word or tool.

The sensing device of a light curtain shall be actuated and the OSSD(s) shall go to and remain in the OFF-state when a test piece in accordance with 4.2.13 is present anywhere within the detection zone either static (at any angle) or moving (with the axis of the cylinder normal to the plane of the detection zone), at any speed between 0 m/s and 1,6 m/s.

The sensing device of a light beam device shall be actuated and the OSSD(s) shall go to and remain in the OFF-state when a test piece in accordance with 4.2.13 is present in the beam centre-line, at any point throughout the operating distance, with the axis of the cylinder normal to the axis of the beam.

Where the supplier states that an AOPD can be used to detect objects moving at speeds greater than those specified above, the above requirements shall be met at any speed up to and including the stated maximum speed(s).

4.1.2.2.2 Sensing function

Replace the second paragraph with the following text:

For a type 3 AOPD or a type 4 AOPD, under normal operating conditions, the OSSD(s) shall go to the OFF-state when a reflective object, as specified in 5.2.1.4 is placed as close as practicable in front of the sensing surface of the emitting/receiving elements.

4.1.3 Types of ESPE

Replace entire clause 4.1.3 with the following text:

Replacement:

In this part of IEC 61496, only type 2, type 3 and type 4 ESPEs are considered. The types differ in their performance in the presence of faults and under influences from environmental conditions. In Part 1, the effects of electrical and electromechanical faults are considered (such faults are listed in Annex B, Part 1).

NOTE The machine supplier and/or the user will determine which type is required for a particular application.

For a type 2 ESPE, in normal operation the output circuit of at least one output signal switching device shall go to the OFF-state when the sensing function is actuated, or when power is removed from the ESPE.

A type 3 ESPE shall fulfil the fault detection requirements of 4.2.2.4.

A type 4 ESPE shall fulfil the fault detection requirements of 4.2.2.5.

For a type 3 or a type 4 ESPE, in normal operation the output circuit of at least two output signal switching devices shall go to the OFF-state when the sensing function is actuated, or when power is removed from the ESPE.

When a single safety-related data interface is used to perform the functions of the OSSD(s), then the data interface and associated safety-related communication interface shall meet the requirements of 4.2.4.4 of IEC 61496-1:2012. In this case, a single safety-related data interface can substitute for two OSSDs in a type 3 ESPE or a type 4 ESPE.

4.2.2.3 Particular requirements for a type 2 ESPE

Delete the last paragraph of clause 4.2.2.3.

4.2.2.4 Particular requirements for a type 3 ESPE

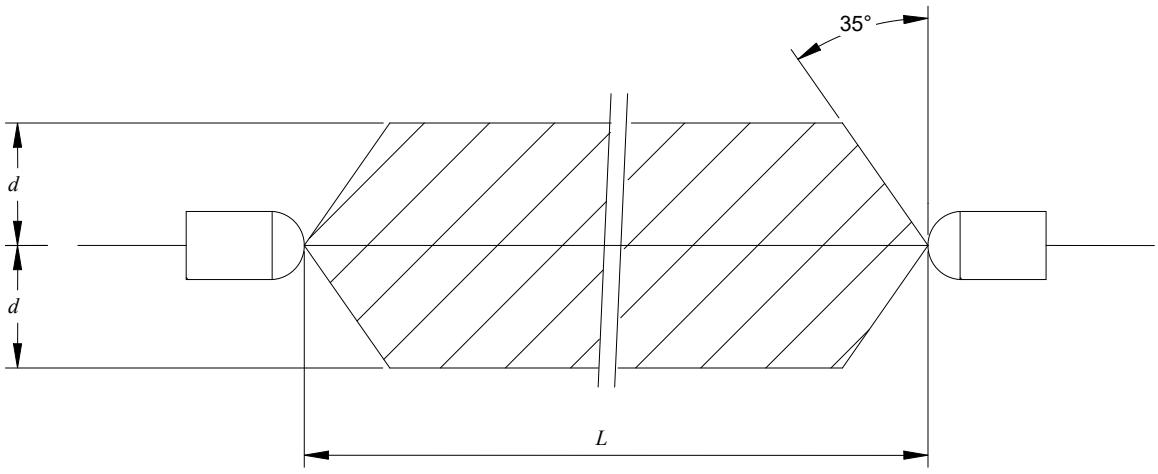
Delete the entire clause 4.2.2.4.

4.2.12 Integrity of the AOPD detection capability

In Clause 4.2.12, update the references in the second paragraph as follows:

If a single fault (as specified in Annex B), which under normal operating conditions (see 5.1.2.1 of IEC 61496-1:2012) would not result in a loss of AOPD detection capability but, when occurring with a combination of the conditions specified above, would result in such a loss, that fault together with that combination of conditions shall be considered as a single fault, and the AOPD shall respond to such a single fault as required in 4.2.2.

In Clause 4.2.12, dimensions for Type 3 AOPD have been added to the legend of Figure 1. Replace Figure 1 with the following:



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For type 4: d = 131 mm, L = 250 to 3 000 mm

For type 3: d = 184 mm, L = 375 to 3 000 mm

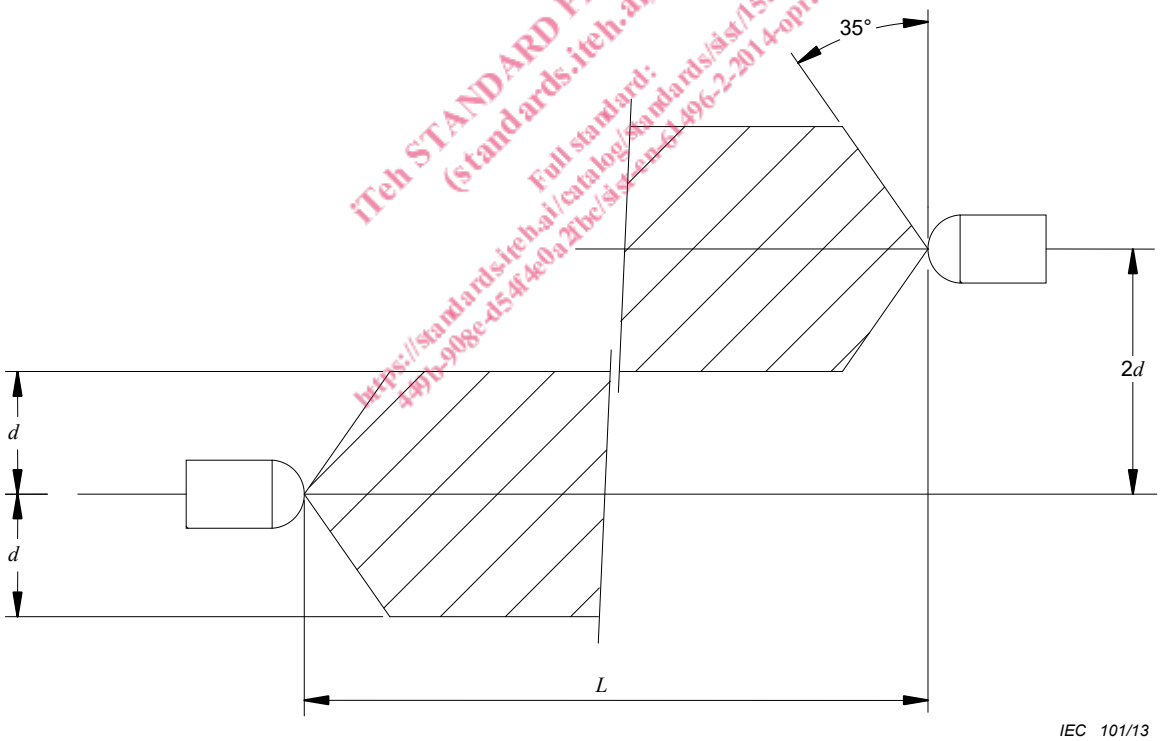
For type 2: d = 262 mm, L = 500 to 3 000 mm

NOTE In this figure, extraneous reflections from surfaces outside the shaded area will not cause a failure to danger. For short ranges (250 mm for type 4, 375 mm for a type 3 and 500 mm for a type 2), the angle of 35° is a limit selected by the working group based on known designs of AOPDs.

Figure 1 – Limit area for the protection against the risk of beam bypass

If the AOPD is intended to provide protection when mounted very close to a reflective surface (i.e. inside the shaded area of Figure 1), the AOPD shall be designed in such a manner that no optical bypassing can occur on the reflective surfaces. For such a device, an EAA much less than 2,5° (for example, less than 0,1°) can be necessary. In this case, Figure 1 does not apply and the limits of protection against optical bypassing shall be as specified by the manufacturer.

In clause 4.2.12, dimensions for Type 3 AOPDs have been added to the legend of Figure 2. Replace Figure 2 with the following figure.



For type 4: 2d = 262 mm, L = 3 000 mm

For type 3: 2d = 368 mm, L = 3 000 mm

For type 2: 2d = 524 mm, L = 3 000 mm

Figure 2 – Limit of vertical and horizontal misalignment

4.3.5 Light interference

Clause 4.3.5 has been moved to Part 1. Delete heading 4.3 and clause 4.3.5 from this Part.

5.1 General

In Table 1 of clause 5.1, in the row labelled "5.4.6.6", the column labelled "Requirements and tests", replace the existing text with the following:

Failure to
danger –
Flashing
beacon (worst-
case alignment)

5.1.2.2 Measurement accuracy

Clause 5.1.2.2 has been moved to Part 1. Delete clause 5.1.2.2 from this part.

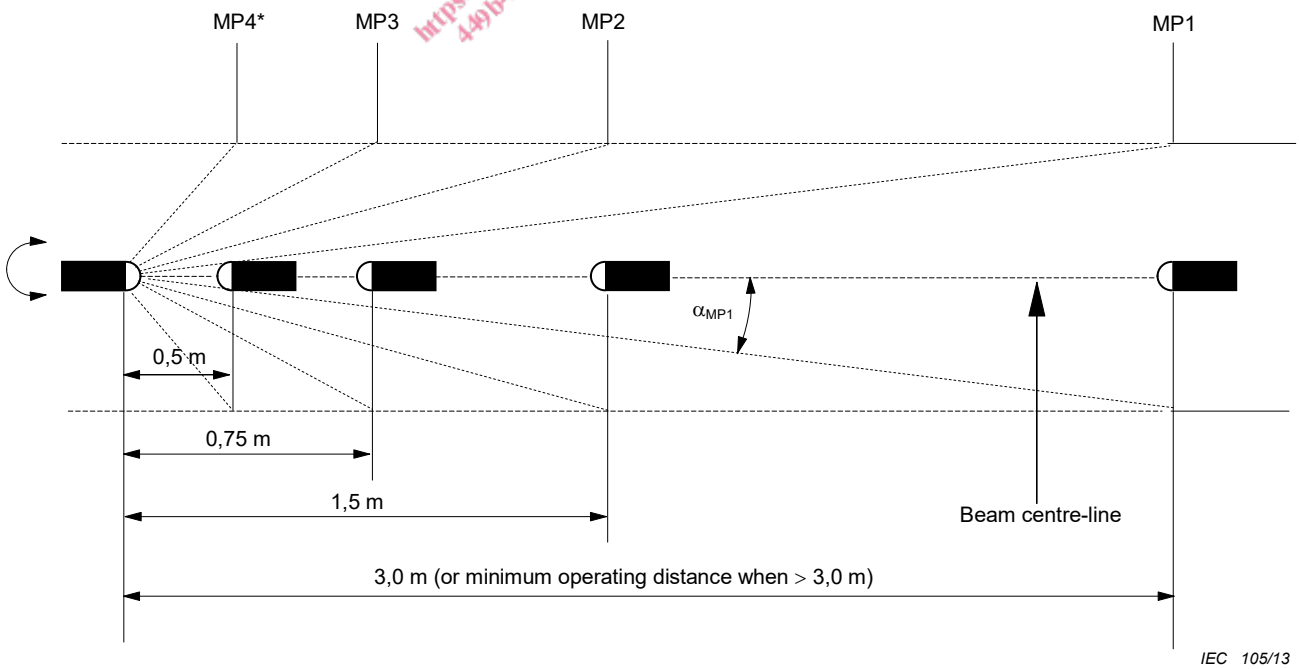
5.2.1.2.2 Analysis of the electro-optical subsystem

Replace list item c) with the following new item c):

c) the characteristics of the optical assemblies (e.g. lens diameter, focal length, position and dimension of the stops, shape of the lens holder, mirrors, retro-reflector)

5.2.1.2.3 Verification of the electro-optical subsystem for GROD

In subclause 5.2.1.2.3, dimensions and calculations have been added to Figure 6 for Type 3 AOPDs. Replace Figure 6 with the following new Figure 6.



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