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STN	**Bezpečnosť strojov Umiestnenie bezpečnostných zariadení so zreteľom na približujúce sa ľudské telo (ISO 13855: 2024)**	**STN EN ISO 13855** 83 3303

Safety of machinery - Positioning of safeguards with respect to the approach of the human body (ISO 13855:2024)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 03/25

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Oznámením tejto normy sa ruší
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EUROPEAN STANDARD
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EN ISO 13855

December 2024

ICS 13.110

Supersedes EN ISO 13855:2010

English Version

Safety of machinery - Positioning of safeguards with respect to the approach of the human body (ISO 13855:2024)

Sécurité des machines - Positionnement des moyens de protection par rapport à l'approche du corps humain (ISO 13855:2024)

Sicherheit von Maschinen - Anordnung von Schutzeinrichtungen im Hinblick auf Annäherung des menschlichen Körpers (ISO 13855:2024)

This European Standard was approved by CEN on 19 July 2024.

CEN 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 CEN-CENELEC Management Centre or to any CEN 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 CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN ISO 13855:2024 E

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European foreword

This document (EN ISO 13855:2024) has been prepared by Technical Committee ISO/TC 199 "Safety of machinery" in collaboration with Technical Committee CEN/TC 114 “Safety of machinery” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2025, and conflicting national standards shall be withdrawn at the latest by June 2025.

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

This document supersedes EN ISO 13855:2010.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 13855:2024 has been approved by CEN as EN ISO 13855:2024 without any modification.

Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request "M/396 Mandate to CEN and CENELEC for Standardisation in the field of machinery" to provide one voluntary means of conforming to essential requirements of Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast).

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding essential requirements of that Directive, and associated EFTA regulations.

Table ZA.1 — Correspondence between this European Standard and Annex I of Directive 2006/42/EC

The relevant Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
1.2.2	10, 11,	
1.4.1	4, 5, 6, 7, 8, 9, 12	
1.4.2.2	12	
1.4.3	4, 5, 6, 7, 8, 9, 10, 11	
1.7.4.2	Annex D	

Table ZA.2 — Applicable Standards to confer presumption of conformity as described in this Annex ZA

Reference in Clause 2	International Standard Edition	Title	Corresponding European Standard Edition
ISO 12100:2010	ISO 12100:2010	Safety of machinery — General principles for design — Risk assessment and risk reduction	EN ISO 12100:2010
ISO 13857:2019	ISO 13857:2019	Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs	EN ISO 13857:2019

The documents listed in the Column 1 of Table ZA.2, in whole or in part, are normatively referenced in this document, i.e. are indispensable for its application. The achievement of the presumption of conformity is subject to the application of the edition of Standards as listed in Column 4 or, if no European Standard Edition exists, the International Standard Edition given in Column 2 of Table ZA.2.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the product(s) falling within the scope of this standard.

International Standard

ISO 13855

Safety of machinery — Positioning of safeguards with respect to the approach of the human body

Sécurité des machines — Positionnement des moyens de protection par rapport à l'approche du corps humain

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO 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, ISO 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 www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 199, *Safety of machinery*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 114, *Safety of machinery,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 13855:2010), which has been technically revised.

The main changes are as follows:

— document expanded for applicable cases and partly revised to be state-of-the-art;

— figures revised for clarity and better understanding;

— scope wording improved to better focus on the document’s content;

— Clause 4 improved for better explanation of the methodology;

— document restructured from Clause 5;

— calculation of reaching distances separated for those applications which are initiating a safety function and those which are not initiating a safety function;

— dynamic separation distance calculation included for mobile applications with unknown human direction of approach;

— improvements for better distinction of different paths of approach;

— requirements for single control devices (hand- and foot-operated) and interlocking guards added;

— annexes revised in order to match with the body text of this document;

— Annexes D to G added.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The structure of safety standards in the field of machinery is as follows:

a) type-A standards (basic safety standards) giving basic concepts, principles for design, and general aspects that can be applied to all machinery;

b) type-B standards (generic safety standards) dealing with one safety aspect or one type of safeguard that can be used across a wide range of machinery:

   — type-B1 standards on particular safety aspects (e.g. safety distances, surface temperature, noise);

   — type-B2 standards on safeguards (e.g. two-hand control devices, interlocking devices, pressure-sensitive devices, guards);

c) type-C standards (machine safety standards) dealing with detailed safety requirements for a particular machine or group of machines.

This document is a type-B1 standard as stated in ISO 12100.

This document is of relevance, in particular, for the following stakeholder groups representing the market players with regard to machinery safety:

— machine manufacturers (small, medium and large enterprises);

— health and safety bodies (regulators, accident prevention organisations, market surveillance).

Others can be affected by the level of machinery safety achieved with the means of the document by the above-mentioned stakeholder groups:

— machine users/employers (small, medium and large enterprises);

— machine users/employees (e.g. trade unions, organizations for people with special needs);

— service providers, e.g. for maintenance (small, medium and large enterprises);

— consumers (in case of machinery intended for use by consumers).

The above-mentioned stakeholder groups have been given the possibility to participate in the drafting process of this document.

In addition, this document is intended for standardization bodies elaborating type-C standards.

The requirements of this document can be supplemented or modified by a type-C standard.

For machines which are covered by the scope of a type-C standard and which have been designed and built according to the requirements of that type-C standard, the following applies: if the requirements of that type-C standard deviate from the requirements in type-B standards, the requirements of that type-C standard take precedence over the provisions of other standards.

Correct positioning of protective devices is critical for them to be effective. In deciding on these positions, a number of aspects are taken into account, such as:

— the necessity of a risk assessment according to ISO 12100;

— the practical experience in the use of the machine;

— the time taken to achieve the intended risk reduction following operation of the safeguard, for example, to stop the machine;

— the bio-mechanical and anthropometric data;

— any intrusion by a part of the body towards the hazard zone until the protective device is actuated;

— the path taken by the body part when moving from the detection zone towards the hazard zone;

— the possible presence of a person between the safeguard and the hazard zone;

— the possibility of undetected access to the hazard zone.

International Standard **ISO 13855:2024(en)**

Safety of machinery — Positioning of safeguards with respect to the approach of the human body

1 Scope

This document specifies requirements for the positioning and dimensioning of safeguards with respect to the approach of the human body or its parts towards hazard(s) within the intended span-of-control as follows:

— the position and dimension of the detection zone(s) of ESPE and pressure-sensitive mats and pressure-sensitive floors;

— the position of two-hand control devices and single control devices;

— the position of interlocking guards.

This document also specifies requirements for the positioning of safety-related manual control devices (SRMCD) with respect to the approach of the human body or its parts from within the safeguard space relative to:

— the position and dimension of the detection zone(s) of ESPE and pressure-sensitive mats and pressure-sensitive floors; and

— the position and dimension of interlocking guards.

When evaluating the ability of the human body or its parts to access SRMCD from within the intended safeguarded space, the requirements of this document are also applicable to determine the dimensions of safeguard(s). Approaches such as running, jumping or falling, are not considered in this document.

NOTE 1 The values for approach speeds (walking speed and upper limb movement) in this document are time tested and proven in practical experience.

NOTE 2 Other types of approach can result in approach speeds that are higher or lower than those defined in this document.

This document applies to safeguards used on machinery for the protection of persons 14 years and older.

Safeguards considered in this document include:

a) electro-sensitive protective equipment (ESPE) such as:

   — active opto-electronic protective devices (AOPDs) (see IEC 61496-2);

   — AOPDs responsive to diffuse reflection that have one or more detection zone(s) specified in two dimensions (AOPDDRs-2D) (see IEC 61496-3);

   — AOPDs responsive to diffuse reflection that have one or more detection zone(s) specified in three dimensions (AOPDDRs-3D) (see IEC 61496-3);

   — vision based protective devices using reference pattern techniques (VBPDPP) (see IEC/TS 61496-4-2);

   — vision based protective devices using stereo vision techniques (VBPDST) (see IEC/TS 61496-4-3);

b) pressure-sensitive mats and pressure-sensitive floors (see ISO 13856-1);

c) two-hand control devices (see ISO 13851);

d) single control devices;

e) interlocking guards (see ISO 14120).

This document is not applicable to:

— safeguards (e.g. pendant two-hand control devices) that can be manually moved, without using tools, nearer to the hazard zone than the separation distance;

— protection against the risks from hazards arising from emissions (e.g. the ejection of solid or fluid materials, radiation, electric arcs, heat, noise, fumes, gases);

— protection against the risks arising from failure of mechanical parts of the machine or gravity falls.

The separation distances derived from this document do not apply to safeguards used solely for presence sensing function.

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.

ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 13857:2019, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs*