Masinate ohutus. Survetundlikud kaitseseadmed. Osa 1: Survetundlike mattide ja survetundlike põrandate konstrueerimise ja katsetamise põhialused KONSOLIDEERITUD TEKST

Safety of machinery. Pressure sensitive protective devices - Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors CONSOLIDATED TEXT

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 1760-1:1999+A1:2009 sisaldab Euroopa standardi EN 1760-1:1997+A1:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 1760-1:1999+A1:2009 consists of the English text of the European standard EN 1760-1:1997+A1:2009.
Standard on kinnitatud Eesti Standardikeskuse 29.05.2009 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 29.05.2009 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 01.04.2009.	Date of Availability of the European standard text 01.04.2009.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

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Võtmesõnad: katsed, konstruktsioon, märgistus, määratlused, ohutusseadised, põrandad, seadmeohutus, surve, tehnilised andmed, tundlikkus, vaibad, õnnetuste vältimine, ärakasutamine

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English Version

Safety of machinery - Pressure sensitive protective devices - Part 1: General principles for the design and testing of pressure sensitive mats and pressure sensitive floors

Sécurité des machines - Dispositifs de protection sensibles à la pression - Partie 1: Principes généraux de conception et d'essai des tapis et planchers sensibles à la pression

Sicherheit von Maschinen - Druckempfindliche Schutzeinrichtungen - Teil 1: Allgemeine Leitsätze für die Gestaltung und Prüfung von Schaltmatten und Schaltplatten

This European Standard was approved by CEN on 26 March 1997 and includes Amendment 1 approved by CEN on 22 February 2009.

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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 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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 1760-1:1997+A1:2009) has been prepared by 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 October 2009, and conflicting national standards shall be withdrawn at the latest by December 2009.

This document includes Amendment 1, approved by CEN on 2009-02-22.

This document supersedes EN 1760-1:1997.

The start and finish of text introduced or altered by amendment is indicated in the text by tags [A1] 〈A1〉.

[A1] This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annexes ZA and ZB, which are integral parts of this document. 〈A1〉

This is the first part of a multi-part type B standard which will cover safety devices that detect the presence of a person through the application of a pressure or force by a part of the person's body. After actuation the safety devices give a stop command which is used by the control system of the machine to provide protection for the person who caused the device to be actuated.

The other parts of the standard will cover:

Part 2: General principles for the design and testing of pressure sensitive edges and pressure sensitive bars (in preparation)

Part 3: General principles for the design and testing of pressure sensitive bumpers (in preparation)

The informative annex A presents timing diagrams for devices with and without reset. The notes in informative annex B provide guidance regarding application. It is recommended that the supplier and customer liaise to examine carefully the constraints presented by the application before placing an order for the equipment.

The safeguarding of machinery [A1] (see 3.20 of EN ISO 12100-1:2003) 〈A1〉 can be achieved by many different means. These means include guards which prevent access to the danger zone by means of a physical barrier (e.g. fixed guards to [A1] EN 953 〈A1〉 and interlocking guards to EN 1088); and protective devices, (e.g. electro-sensitive protective equipment to [A1] EN 61496-1 〈A1〉 and pressure-sensitive protective devices to this standard).

Type C standards makers and designers of machinery/installations should consider the best way to achieve the required level of safety taking into account the intended application and the results of the risk assessment (see [A1] EN ISO 14121-1 〈A1〉).

The best solution may combine several of these different means. It is recommended that the machinery/installation supplier and the user examine together carefully the existing constraints before making their decision on the choice of safeguarding means.

The notes in informative annex C give guidance regarding the design of pressure sensitive mats and pressure sensitive floors. Informative annex D gives guidance for installation, commissioning and testing. Informative annex E contains bibliography.

This European Standard does not specify the dimensions or the configuration of the effective sensing area of pressure sensitive mat(s) or floor(s) in relation to any particular application. However, there is a requirement for the manufacturer of the safety device to provide sufficient information to enable the user (i.e. the machinery manufacturer and/or the user of the machinery) to specify an adequate arrangement.

〚A1〉 *deleted text* 〈A1〛

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Pressure sensitive protective devices are used in a wide variety of applications with different conditions of use relating, for example, to extremes of loading, electrical, physical and chemical environments. They are interfaced with the machine controls to ensure that the machine reverts to a safe condition if the pressure sensitive device is actuated.

Each type of application presents particular hazards. It is not the intention of this standard to identify those hazards nor to recommend specific methods of application to particular machines. This is normally the function of machine specific standards.

1 Scope

This Standard specifies requirements for pressure sensitive mats and floors normally actuated by the feet for use as safety devices to protect persons from dangerous machinery. The minimum safety requirements for the performance, marking and documentation are given.

The Standard covers pressure sensitive mats and floors, regardless of type of energy used, e.g. electrical, hydraulic, pneumatic or mechanical.

This standard covers mats and floors designed to detect:

a) Persons weighing more than 35 kg;

b) And persons (e.g. children) weighing more than 20 kg.

The detection of persons weighing less than 20 kg is not covered by this standard.

This European Standard does not specify the dimensions or the configuration of the effective sensing area of pressure sensitive mat(s) or floor(s) in relation to any particular application.

2 Normative references

[A1] The following referenced documents are indispensable for the application 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. [/A1]

[A1] *deleted text* [/A1]

[A1] EN 953:1997, *Safety of machinery – Guards – General requirements for the design and construction of fixed and movable guards* [/A1]

EN 954-1:1996, *Safety of machinery – Safety-related parts of control systems – Part 1: General principles for design*

EN 982:1996, *Safety of machinery – Safety requirements for fluid power systems and their components - Hydraulics*

EN 983:1996, *Safety of machinery – Safety requirements for fluid power systems and their components – Pneumatics*

[A1] EN 999 [A1], *Safety of machinery – The positioning of protective equipment in respect of approach speeds of parts of the human body*

[A1] *deleted text* [A1]

EN 1088:1995, *Safety of machinery – Interlocking devices associated with guards – Principles for design and selection*

[A1] *deleted text* [A1]

EN 50081, *Electromagnetic compatibility – Generic emission standard*

EN 50082, *Electromagnetic compatibility – Generic immunity standard*

EN 60204-1:1992, *Safety of machinery; electrical equipment of machines; part 1: general requirements (IEC 204-1:1992, modified)*

EN 60439-1:1994, *Low-voltage switchgear and controlgear assemblies; part 1: type-tested and partially type-tested assemblies (IEC 439-1:1992 + corrigendum 1993)*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 529:1989)*

EN 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 2: Electrostatic discharge immunity test – Basic EMC publication (IEC 1000-4-2:1995)*

EN 61000-4-3, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 3: Radiated, radio-frequency, electromagnetic field immunity test (IEC 1000-4-3:1995, modified)*

EN 61000-4-4, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 4: Electrical fast transient/burst immunity test – Basic EMV publication (IEC 1000-4-4:1995)*

EN 61000-4-5, *Electromagnetic compatibility (EMC) – Part 4: Testing and measurement techniques – Section 5: Surge immunity test (IEC 1000-4-5:1995)*

EN 61310-2, *Safety of machinery – Indication, marking and actuation – Part 2: Requirements for marking (IEC 1310-2:1995)*

[A1] EN ISO 12100-1:2003, *Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles (ISO 12100-2:2003)* [A1]

[A1] EN ISO 14121-1, *Safety of machinery – Risk assessment – Part 1: Principles (ISO 14121-1:2007)* [A1]

[A1] EN ISO 14122-2, *Safety of machinery – Permanent means of access to machinery – Part 2: Working platforms and walkways (ISO 14122-2:2001)* [A1]

IEC 68-2-3:1969, *Basic environmental testing procedures – Part 2: Tests. Test Ca: Damp heat, steady state*

IEC 68-2-6:1995, *Environmental testing – Part 2: Tests – Test Fc: Vibration (sinusoidal)*

IEC 68-2-14:1984, *Basic environmental testing procedures – Part 2: Tests. Test N: Change of temperature*

ISO 6431:1992, *Pneumatic fluid power; single rod cylinders, 1000 kPa (10 bar) series, with detachable mountings, bores from 32 mm to 320 mm; mounting dimensions*