

SLOVENSKI STANDARD oSIST prEN ISO 10218-2:2008

01-september-2008

Roboti za industrijska okolja - Varnostne zahteve - 2. del: Robotski sistem in integracija

Robots for industrial environments - Safety requirements -- Part 2: Robot cell and line

Industrieroboter - Sicherheitsanforderungen - Teil 2 - Robotersystem und Integration

Robots pour environnements industriels - Exigences de sécurité - Partie 2: Système robot et intégration

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EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

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Will supersede EN 775:1992

English Version

Robots for industrial environments - Safety requirements - Part 2: Robot system and integration (ISO/DIS 10218-2:2008)

Robots pour environnements industriels - Exigences de sécurité - Partie 2: Système robot et intégration (ISO/DIS 10218-2:2008)

Industrieroboter - Sicherheitsanforderungen - Teil 2: Robotersystem und Integration (ISO/DIS 10218-2:2008)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 310.

If this draft becomes a European Standard, 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.

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

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

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prEN ISO 10218-2:2008 (E)

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Foreword

This document (prEN ISO 10218-2:2008) has been prepared by Technical Committee ISO/TC 184 "Industrial automation systems and integration" in collaboration with Technical Committee CEN/TC 310 "Advanced Manufacturing Technologies" the secretariat of which is held by BSI.

This document is currently submitted to the parallel Enquiry.

This document will supersede EN 775:1992.

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 EC Directive(s).

Endorsement notice

The text of ISO/DIS 10218-2:2008 has been approved by CEN as a prEN ISO 10218-2:2008 without any modification.

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DRAFT INTERNATIONAL STANDARD ISO/DIS 10218-2

ISO/TC 184/SC 2

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Robots for industrial environments — Safety requirements —

Part 2: Robot system and integration

Robots pour environnements industriels — Exigences de sécurité —

Partie 2: Système robot et intégration

ICS 25.040.30

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The CEN Secretary-General has advised the ISO Secretary-General that this ISO/DIS covers a subject of interest to European standardization. In accordance with the ISO-lead mode of collaboration as defined in the Vienna Agreement, consultation on this ISO/DIS has the same effect for CEN members as would a CEN enquiry on a draft European Standard. Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month FDIS vote in ISO and formal vote in CEN.

To expedite distribution, this document is circulated as received from the committee secretariat. ISO Central Secretariat work of editing and text composition will be undertaken at publication stage.

Pour accélérer la distribution, le présent document est distribué tel qu'il est parvenu du secrétariat du comité. Le travail de rédaction et de composition de texte sera effectué au Secrétariat central de l'ISO au stade de publication.

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 10218-2 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 2, *Robots and robotic devices*.

This International Standard is complimentary and in addition to ISO 10218-1:2006 which covers the robot only. This wholly revised International Standard adds additional information in line with ISO 12100 and ISO 11161 standards for requirements to identify and respond in a type C standard to unique hazards presented by the integration, installation and requirements for use of industrial robots. New technical requirements include but are not limited to instructions for applying the new requirements in ISO 10218 1:2006 for safety-related control system performance, robot stopping function, enabling device, programme verification, wireless pendant criteria, collaborating robot criteria, and updated design for safety.

This International Standard is part of a series of standards dealing with robots and robotic devices. Other standards cover such topics as integrated robotic systems, coordinate systems and axis motions, general characteristics, performance criteria and related testing methods, terminology, and mechanical interfaces. It is noted that these standards are interrelated and also related to other International Standards. Generally other technical solutions are possible, that ensure the same level of safety.

This International Standard includes ten annexes; Annexes A and B which are normative, and Annexes C through J which are informative.



Figure 1 — Graphical view of standards relationships

ISO/DIS 10218-2

ISO 10218 consists of the following parts, under the general title *Robots for industrial environments* — Safety *requirements*:

- Part 1: Robot
- Part 2: Robot systems and integration

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Introduction

This International Standard has been created in recognition of the particular hazards that are presented by industrial robot systems when integrated and installed in work cells and lines.

Hazards are well recognized but the sources of the hazards are frequently unique to a particular robot system. The number and types of hazards are directly related to the nature of the automation process and the complexity of the installation.

The risks associated with these hazards vary with the type of robot used and its purpose and the way in which it is installed, programmed, operated, and maintained.

For the purpose of understanding requirements in this International Standard, a word syntax is used to denote absolute requirements from recommended practices or suggested actions. The word "shall" is used to identify requirements necessary for compliance with the standard. Such requirements must be accomplished unless an alternative instruction is provided or a suitable alternative is determined by a risk assessment. The word "should" is used to identify suggestions, recommended actions, or possible solutions for requirements, but alternatives are possible and the suggestion actions are not absolute.

In recognition of the variable nature of hazards with the application of industrial robots, this International Standard provides guidance for the assurance of safety in the integration and installation of robots. Since safety in the use of industrial robots is influenced by the design of the particular robot system, a supplementary, though equally important, purpose is to provide guidelines for the design, construction and information for use of robot systems. Guidelines for the robot portion of the system can be found in ISO 10218-1; Robots for industrial environments – Safety requirements – Part 1: Robot.

Providing for a safe robot system requires the cooperation of a variety of "stakeholders" – those corporate entities that share in a responsibility for the ultimate purpose of providing a safe working environment. Stakeholders may be identified as manufacturers, suppliers, integrators, and users (the entity responsible for employing robots); but all share the common goal of a safe (robot) machine. The requirements may be assigned to one of the stakeholders, but overlapping responsibilities can involve multiple stakeholders in the same requirements. While using this International Standard, the reader is cautioned that all of the requirements identified may apply to them, even if not specifically addressed by "assigned" stakeholder tasks.

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Robots for industrial environments — Safety requirements —

Part 2: **Robot system and integration**

1 Scope

This International Standard specifies safety requirements for both the integration of industrial robots and robot systems as defined in ISO 10218-1:2006. It describes the basic hazards and hazardous situations identified with these systems and provides requirements to eliminate or adequately reduce the risks associated with these hazards. This International Standard shall be used for the robot or robot system as part of an integrated manufacturing system.

2 Normative references

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.

ISO 4413, Hydraulic fluid power — General rules relating to systems

ISO 4414, Pneumatic fluid power — General rules relating to systems

ISO 10218-1:2006, Robots for industrial environments — Safety requirements — Part 1: Robot

ISO 11161, Safety of machinery — Industrial automation systems — Safety of integrated manufacturing systems — Basic requirements

ISO 12100 -1, Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology

ISO 12100-2, Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles

ISO 13849-1:2006, Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

ISO 13851, Safety of machinery — Two-hand control devices — Functional aspects and design principles

ISO 13854, Safety of machinery - Minimum gaps to avoid crushing of parts of the human body

ISO 13855, Safety of machinery — Position of protective equipment with respect to the approach speeds of parts of the human body

ISO 13856-1, Safety of machinery — Pressure-sensing protective devices — Part 1: General principles for design and testing of pressure-sensitive mats and pressure-sensitive floors

ISO 13857, Safety of machinery — Safety distances to prevent danger zones being reached by the upper limbs and lower limbs

ISO 14118, Safety of machinery - Prevention of unexpected start-up