

BS EN ISO 10218-2:2011



BSI Standards Publication

Robots and robotic devices — Safety requirements for industrial robots

Part 2: Robot systems and integration
(ISO 10218-2:2011)

bsi.

...making excellence a habit.™

This is a preview. [Click here to purchase the full publication.](#)

National foreword

This British Standard is the UK implementation of EN ISO 10218-2:2011.

The UK participation in its preparation was entrusted to Technical Committee AMT/-/2, Robots and robotic devices.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2011

ISBN 978 0 580 65928 7

ICS 13.110; 25.040.30

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 July 2011.

Amendments issued since publication

Date	Text affected
------	---------------

English Version

Robots and robotic devices - Safety requirements for industrial robots - Part 2: Robot systems and integration (ISO 10218-2:2011)

Robots et dispositifs robotiques - Exigences de sécurité pour les robots industriels - Partie 2: Systèmes robots et intégration (ISO 10218-2:2011)

Roboter und Robotikgeräte - Sicherheitsanforderungen - Teil 2: Industrierobotersystem und Integration (ISO 10218-2:2011)

This European Standard was approved by CEN on 21 April 2011.

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.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Foreword

This document (EN ISO 10218-2:2011) has been prepared by Technical Committee ISO/TC 184 "Automation systems and integration" in collaboration with Technical Committee CEN/TC 310 "Advanced automation technologies and their applications" the secretariat of which is held by BSI.

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 January 2012, and conflicting national standards shall be withdrawn at the latest by January 2012.

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

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.

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

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 10218-2:2011 has been approved by CEN as a EN ISO 10218-2:2011 without any modification.

Annex ZA **(informative)**

Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2006/42/EC Machinery safety.

Once this standard is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of this standard confers, within the limits of the scope of this standard, a presumption of conformity with the relevant Essential Requirements of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

**Robots and robotic devices — Safety
requirements for industrial robots —**

**Part 2:
Robot systems and integration**

*Robots et dispositifs robotiques — Exigences de sécurité pour
les robots industriels —*

Partie 2: Systèmes robots et intégration



Reference number
ISO 10218-2:2011(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Hazard identification and risk assessment	4
4.1 General	4
4.2 Layout design	5
4.3 Risk assessment	6
4.4 Hazard identification	8
4.5 Hazard elimination and risk reduction	9
5 Safety requirements and protective measures	9
5.1 General	9
5.2 Safety-related control system performance (hardware/software)	9
5.3 Design and installation	10
5.4 Limiting robot motion	14
5.5 Layout	16
5.6 Robot system operational mode application	17
5.7 Pendants	21
5.8 Maintenance and repair	22
5.9 Integrated manufacturing system (IMS) interface	23
5.10 Safeguarding	24
5.11 Collaborative robot operation	32
5.12 Commissioning of robot systems	35
6 Verification and validation of safety requirements and protective measures	36
6.1 General	36
6.2 Verification and validation methods	37
6.3 Required verification and validation	37
6.4 Verification and validation of protective equipment	37
7 Information for use	38
7.1 General	38
7.2 Instruction handbook	39
7.3 Marking	43
Annex A (informative) List of significant hazards	44
Annex B (informative) Relationship of standards related to protective devices	47
Annex C (informative) Safeguarding material entry and exit points	49
Annex D (informative) Operation of more than one enabling device	52
Annex E (informative) Conceptual applications of collaborative robots	53
Annex F (informative) Process observation	55
Annex G (normative) Means of verification of the safety requirements and measures	58
Bibliography	71

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, *Automation systems and integration*, Subcommittee SC 2, *Robots and robotic devices*.

ISO 10218 consists of the following parts, under the general title *Robots and robotic devices — Safety requirements for industrial robots*:

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