SVENSK STANDARD
SS-EN ISO 10218-2:2025

Robotik – Säkerhetskrav – Del 2: Industrirobotapplikationer och robotceller (ISO 10218-2:2025)

Robotics — Safety requirements — Part 2: Industrial robot applications and robot cells (ISO 10218-2:2025)

Svenska Institutet för Standarder

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Fastställd: 2025-03-12
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Europastandarden EN ISO 10218-2:2025 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 10218-2:2025.

Denna standard ersätter SS-EN ISO 10218-2:2011, utgåva 1

The European Standard EN ISO 10218-2:2025 has the status of a Swedish Standard. This document contains the official version of EN ISO 10218-2:2025.

This standard supersedes the SS-EN ISO 10218-2:2011, edition 1

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

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English Version

Robotics - Safety requirements - Part 2: Industrial robot applications and robot cells (ISO 10218-2:2025)

Robotique - Exigences de sécurité - Partie 2: Applications robotisées industrielles et cellules robotisées (ISO 10218-2:2025)

Robotik - Sicherheitsanforderungen für Robotersysteme in industrieller Umgebung - Teil 2: Robotersysteme, Roboteranwendungen und Integration von Roboterzellen (ISO 10218-2:2025)

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Contents

Page

European foreword ... **x**
Foreword ... **xi**
Introduction ... **xii**
1 Scope ... **1**
2 Normative references ... **2**
3 Terms, definitions, symbols and abbreviated terms ... **4**
3.1 Terms and definitions ... 4
3.1.1 Robot, robot system, robot application, robot cell - related ... 4
3.1.2 Sub-assemblies and components ... 5
3.1.3 Controls-related ... 6
3.1.4 Program-related ... 7
3.1.5 Power-, energy-related ... 8
3.1.6 Hazard-related ... 8
3.1.7 Role-related ... 8
3.1.8 Functional safety-related ... 9
3.1.9 Spaces, zones and distances ... 10
3.1.10 Risk reduction measures ... 11
3.1.11 Verification and validation ... 13
3.1.12 Contact-related ... 13
3.2 Abbreviated terms and symbols ... 14
4 Risk assessment ... **18**
4.1 General ... 18
4.2 Characteristics of robot applications and robot cells ... 19
4.3 Characteristics of collaborative applications ... 20
4.3.1 General ... 20
4.3.2 Risk assessment for contacts between moving parts of the robot application and operator(s) ... 21
5 Safety requirements and risk reduction measures ... **21**
5.1 General ... 21
5.2 Design ... 22
5.2.1 General ... 22
5.2.2 Materials, mechanical strength and mechanical design ... 22
5.2.3 Provisions for lifting or moving ... 24
5.2.4 Hazardous substances ... 24
5.2.5 Stability ... 24
5.2.6 Temperature and fire risks ... 24
5.2.7 Special equipment ... 24
5.2.8 Position holding ... 25
5.2.9 Additional axis (axes) ... 25
5.2.10 Power loss or change ... 25
5.2.11 Component malfunction ... 25
5.2.12 Hazardous energy ... 26
5.2.13 Electrical, pneumatic and hydraulic parts ... 27
5.2.14 Tool centre point (TCP) setting ... 27
5.2.15 Payload setting ... 27
5.2.16 Cybersecurity ... 27
5.3 Robot cell integration ... 28
5.3.1 General ... 28
5.3.2 Span-of-control ... 28
5.3.3 Span-of-control of emergency stop function ... 28
5.3.4 Operational modes with multi-robot applications or robot cells ... 29
5.3.5 Local control, remote control and single-point-of-control ... 29
5.3.6 Automatic workpiece feeding ... 29

5.4 Layout ... 29
5.4.1 General ... 29
5.4.2 Use and limits ... 30
5.4.3 Design ... 30
5.4.4 Design for collaborative applications ... 31
5.4.5 Prevention of trapping within the safeguarded space ... 32
5.4.6 Establishing restricted spaces ... 32
5.4.7 Limiting motion ... 32
5.5 Safety functions ... 34
5.5.1 General ... 34
5.5.2 Functional safety standards ... 34
5.5.3 Performance ... 34
5.5.4 Failure or fault detection ... 35
5.5.5 Parameterization of safety functions ... 35
5.5.6 Speed limit(s) monitoring ... 35
5.5.7 Start / restart interlock and reset ... 36
5.5.8 Monitored-standstill ... 37
5.5.9 Communications ... 37
5.5.10 Electromagnetic requirements ... 38
5.6 Stopping ... 38
5.6.1 General ... 38
5.6.2 Emergency stop ... 39
5.6.3 Protective stop ... 39
5.6.4 Normal stop ... 40
5.6.5 Associated equipment stopping ... 40
5.7 Control functions ... 40
5.7.1 General ... 40
5.7.2 Modes ... 40
5.7.3 Protection from unexpected start-up ... 43
5.7.4 Status indication and warning devices ... 44
5.7.5 Single-point-of-control ... 44
5.7.6 Local and remote control ... 44
5.7.7 Enabling devices ... 45
5.7.8 Control stations ... 46
5.7.9 Simultaneous motion ... 48
5.8 Safeguards and their use ... 48
5.8.1 General ... 48
5.8.2 Establishing a safeguarded space ... 49
5.8.3 Perimeter safeguarding ... 49
5.8.4 Overriding of protective devices ... 49
5.8.5 Guards ... 49
5.8.6 Sensitive protective equipment ... 50
5.8.7 Muting ... 52
5.8.8 Overriding of SPE ... 52
5.8.9 Minimum distances ... 52
5.8.10 Safeguarding to protect from unexpected restart ... 53
5.9 End-effectors ... 53
5.9.1 General ... 53
5.9.2 Risk reduction measures ... 54
5.9.3 Shape and surfaces ... 55
5.9.4 Protective devices and/or safety functions ... 55
5.9.5 End-effectors and robot application design ... 56
5.9.6 End-effectors exchange systems ... 56
5.10 Vertical transfer components ... 57
5.10.1 Mechanical design ... 57
5.10.2 Prevention of falling hazards ... 57
5.10.3 Prevention of crushing hazards ... 57
5.10.4 Control of movements ... 58
5.11 Lasers and laser equipment ... 58

5.12 Material handling, manual load/unload stations and material flow ... 58
5.12.1 Material handling ... 58
5.12.2 Manual load/unload stations and other manual stations ... 58
5.12.3 Material flow ... 59
5.13 Adjacent robot cells ... 59
5.14 Collaborative applications ... 60
5.14.1 General ... 60
5.14.2 Safeguarded spaces ... 61
5.14.3 Transitions ... 61
5.14.4 Hand-guided control (HGC) ... 62
5.14.5 Speed and separation monitoring (SSM) ... 63
5.14.6 Power and force limiting (PFL) ... 64
5.15 Assembly, installation and commissioning ... 67
5.15.1 Commissioning of robot applications ... 67
5.15.2 Environmental conditions ... 68
5.15.3 Power ... 68
5.15.4 Lighting ... 68
5.15.5 Labelling ... 69
5.16 Maintenance ... 69
5.16.1 General ... 69
5.16.2 Movement without drive power ... 69

6 Verification and validation ... 69
6.1 General ... 69
6.2 Verification and validation methods ... 70
6.3 Verification and validation of guards, protective devices, safety function parameter settings and biomechanical threshold limits ... 70
6.3.1 Guards and protective devices ... 70
6.3.2 Safety function parameter settings ... 70
6.3.3 Biomechanical limits ... 70
6.4 Complementary protective measures ... 70

7 Information for use ... 71
7.1 General ... 71
7.2 Signals and warning devices ... 71
7.3 Marking ... 71
7.4 Signs (pictograms) and written warnings ... 72
7.5 Instruction handbook ... 72
7.5.1 General ... 72
7.5.2 Identification ... 72
7.5.3 Intended use ... 72
7.5.4 Transport, handling and lifting ... 73
7.5.5 Installation ... 73
7.5.6 Commissioning and programming ... 73
7.5.7 Abnormal and emergency situations ... 74
7.5.8 Settings and operation ... 75
7.5.9 Maintenance ... 75
7.5.10 Decommissioning ... 76
7.5.11 Remote interventions ... 76
7.5.12 Hazardous energy ... 76
7.5.13 Limiting devices and restricted space ... 76
7.5.14 Movement without drive power ... 77
7.5.15 Control station(s) ... 77
7.5.16 Functional safety ... 77
7.5.17 Operating modes ... 78
7.5.18 Enabling devices ... 78
7.5.19 Vibration ... 78
7.5.20 End-effector(s) ... 79
7.5.21 Manual load/ unload stations ... 79
7.5.22 Collaborative applications ... 79

7.5.23 Cybersecurity ... 80
Annex A (informative) **List of significant hazards** ... **81**
Annex B (informative) **Illustrations of spaces** ... **91**
Annex C (normative) **Safety function performance requirements** ... **97**
Annex D (Informative) **Required safety function information** ... **117**
Annex E (informative) **Example of determination of the PL_r or required SIL** ... **119**
Annex F (informative) **Comparison of stop functions** ... **122**
Annex G (informative) **Graphical symbols** ... **124**
Annex H (informative) **Means of verification and validation of the design and protective measures** **126**
Annex I (informative) **End-effectors** ... **162**
Annex J (informative) **Safeguarding manual load and unload stations** ... **166**
Annex K (informative) **Safeguarding material entry and exit point** ... **178**
Annex L (normative) **Speed and separation monitoring (SSM) – separation distance** ... **183**
Annex M (informative) **Limits for quasi-static and transient contact** ... **188**
Annex N (informative) **Validation of PFL collaborative applications** ... **199**
Annex O (informative) **Optional features** ... **215**
Annex P (informative) **Implementation of start/restart interlock and reset functions** ... **217**
Annex Q (informative) **Relationship of standards related to safeguards** ... **219**
Bibliography ... **220**
Annex ZA (informative) **Relationship between this European Standard and the essential requirements of Directive2006/42/EC aimed to be covered** ... **223**

European foreword

This document (EN ISO 10218-2:2025) has been prepared by Technical Committee ISO/TC 299 "Robotics" 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 September 2025, and conflicting national standards shall be withdrawn at the latest by March 2027.

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 10218-2:2011.

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.

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Endorsement notice

The text of ISO 10218-2:2025 has been approved by CEN as EN ISO 10218-2:2025 without any modification.

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 document 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).

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This document was prepared by Technical Committee ISO/TC 299, *Robotics,* in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 310, *Advanced automation technologies and their applications,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 10218-2:2011), which has been technically revised.

The main changes are as follows:

— emphasising robot application and not robot system, as the robot application includes the workpieces, task program, and the machinery and equipment to support the application and intended tasks;

— incorporating safety requirements for collaborative applications (formerly, the content of ISO/TS 15066);

— clarifying requirements for functional safety;

— adding requirements for cybersecurity to the extent that it applies.

A list of all parts in the ISO 10218 series can be found on the ISO website.

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.

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Introduction

This document has been created in recognition of the hazards that are presented by robots when they are integrated and installed with end-effectors into robot applications and robot cells. ISO 10218-1 addresses robots as partly completed machinery, while this document addresses robots integrated into completed machinery for specific robot applications.

This document is a type-C standard according to ISO 12100.

This document is of relevance for the following stakeholder groups representing the market players regarding safety of robot applications and robot cells:

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

— robot application integrators (small, medium and large enterprises);

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

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

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

— robot application users/employees (e.g. trade unions);

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

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

Robot applications, and the extent to which hazards, hazardous situations and events, are covered and indicated in the Scope of this document.

When provisions of a type-C standard are different from those which are stated in type-A or type-B standards, the provisions of the type-C standard take precedence over the provisions of the other standards for machines that have been designed and built in accordance with the provisions of the type-C standard.

Hazards associated with robot applications are well recognized, but the sources of the hazards are frequently unique to each robot application. The number and type(s) of hazard(s) are directly related to the nature of the automation process and the complexity of the application. The risks associated with these hazards vary with the robot used, its safety functions, and the integration, installed, programs, use, and maintenance. This document provides requirements for safety in the integration of robots into robot applications and robot cells. The requirements include safeguarding of operators during integration, commissioning, functional testing, programming, operation, maintenance and repair. Requirements for the robot can be found in ISO 10218-1.

The ISO 10218 series deals with robotics in an industrial environment, which is comprised of workplaces where the public is excluded or restricted from access and the allowed people (operators) are working adults. Other standards cover such topics as general characteristics, coordinate systems and axis motions, mechanical interfaces, performance criteria and related testing methods, and end-effectors.

There are a broad range of robot applications and robot cell(s). Therefore, it is not possible to provide a list of all significant hazards, hazardous situations or events into which a robot application can be integrated. Moreover, the same kind of applications can have different levels of risk, resulting from different designs which correspond to the intended application (e.g. paint spraying on large or small parts, handling of a small harmful payload like a hot metal bolt or a large harmless payload like a box of paper tissues).

Other standards can be applicable to associated machinery and equipment in robot applications and robot cells.

For ease of reading this document, the words “robot”, “robot system” and “robot application” refer to “industrial robot”, “industrial robot system” and “industrial robot application” as defined in ISO 10218-1 and this document.

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This document has been updated based on experience gained since the release of the first edition of ISO 10218-2 in 2011. This document remains aligned with minimum requirements of a harmonized type-C standard for robot applications and robot cells in an industrial environment. Providing for a safe robot application and a safe robot cell depends on the cooperation of a variety of “stakeholders”. Stakeholders can include designers, manufacturers, suppliers and integrators. Users are the entity responsible for using robot applications and robot cells. Users can also be any of the other stakeholder roles.

Where appropriate, ISO/TS 15066:2016 on the safety of collaborative robot applications was added to the ISO 10218 series. Because human-robot collaboration relates to the application and not to the robot alone, most of the requirements of ISO/TS 15066 have been incorporated into this document. Safety functions that enable a collaborative application can be part of the robot (e.g. PFL), or can be provided by a protective device, or a combination.

It is important to emphasize that the term “collaborative robot” is not used in this document. Only the application can be developed, verified, and validated as a collaborative application. In addition, the term “collaborative operation” is not used in this document.

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Robotics — Safety requirements

Part 2:
Industrial robot applications and robot cells

IMPORTANT The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

1 Scope

This document specifies requirements for the integration of industrial robot applications and industrial robot cells. The following are addressed:

— the design, integration, commissioning, operation, maintenance, decommissioning and disposal;

— integration of machines and components;

— information for use for the design, integration, commissioning, operation, maintenance, decommissioning and disposal.

This document is not applicable to the following uses and applications of industrial robots:

— underwater;

— law enforcement;

— military (defence);

— airborne and space, including outer space;

— medical;

— healthcare of a person;

— prosthetics and other aids for the physically impaired;

— service robots, which provide a service to a person and as such the public can have access;

— consumer products, as this is household use to which the public can have access;

— lifting or transporting people;

— multi-purpose lifting devices or machinery, e.g. cranes, forklift trucks.

NOTE Applications for the automation of laboratories are not considered as medical or healthcare of a person.

This document deals with the significant hazards, hazardous situations or hazardous events when used as intended and under specified conditions of misuse which are reasonably foreseeable by the integrator.

This document provides basic requirements for industrial robot applications, but does not cover the hazards related to the following:

— emission of airborne noise;

— severe conditions (e.g. extreme climates, freezer use, strong magnetic fields) outside of manufacturer's specifications;

— underground use;

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— use that has hygienic requirements;

— processing of any material (e.g. food, cosmetics, pharmaceutical, metal);

— use in nuclear environments;

— use in potentially explosive environments;

— mobility when robots or manipulators are integrated with driverless industrial trucks;

— mobility when robots or manipulators are integrated with mobile platforms;

— use in environments with hazardous ionizing and non-ionizing radiation levels;

— hazardous ionizing and non-ionizing radiation;

— handling loads the nature of which could lead to dangerous situations (e.g. molten metals, acids/bases, radiating materials);

— when the public or non-working adults have access.

Emission of acoustic noise could be identified to be a significant hazard, but emission of noise is not covered in this document.

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 3864-1:2011, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs and safety markings*

ISO 3864-2:2016, *Graphical symbols — Safety colours and safety signs — Part 2: Design principles for product safety labels*

ISO 3864-3:2024, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 3864-4:2011, *Graphical symbols — Safety colours and safety signs — Part 4: Colorimetric and photometric properties of safety sign materials*

ISO 4413:2010, *Hydraulic fluid power — General rules and safety requirements for systems and their components*

ISO 4414:2010, *Pneumatic fluid power — General rules and safety requirements for systems and their components*

ISO 7010:2019, *Graphical symbols — Safety colours and safety signs — Registered safety signs*

ISO 8995-1:2002, *Lighting of work places — Part 1: Indoor*

ISO/CIE 8995-3:2018, *Lighting of work places — Part 3: Lighting requirements for safety and security of outdoor work places*

ISO 10218-1:2025, *Robotics – Safety requirements – Part 1: Industrial robots*

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

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