



# SLOVENSKI STANDARD

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**Varnost dvigal (žerjavov) - Zahteve za zdravje in varnost - 2. del: Naprave za omejevanje in zaznavanje**

Cranes safety - Requirements for health and safety - Part 2: Limiting and indicating devices

Sicherheit von Kranen - Gesundheits- und Sicherheitsanforderungen - Teil 2: Begrenzungs- und Anzeigeeinrichtungen

Sécurité des appareils de levage à charge suspendue - Prescriptions relatives à l'hygiène et à la sécurité - Partie 2: Dispositifs limiteurs et indicateurs

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 12077-2**

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English Version

## Cranes safety - Requirements for health and safety - Part 2: Limiting and indicating devices

Sécurité des appareils de levage à charge suspendue -  
Prescriptions relatives à l'hygiène et à la sécurité -  
Partie 2: Dispositifs limiteurs et indicateurs

Sicherheit von Kranen - Gesundheits- und  
Sicherheitsanforderungen - Teil 2: Begrenzungs- und  
Anzeigeeinrichtungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 147.

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.

This draft European Standard was established by CEN 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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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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## European foreword

This document (prEN 12077-2:2023) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12077-2:1998+A1:2008.

In comparison with the previous edition, the following technical modifications have been made:

- updated reference documents and cross-references;
- revised grammar and linguistic consistency;
- revised the List of significant hazards and moved it to Annex A;
- revised Annex ZA and added a Bibliography;
- revised and updated part 3;
- revised and updated subclauses 4.2.6, 4.2.7, 4.2.9, 4.3.1, 4.3.2, 4.3.4, 4.3.5, 4.4.1.1, 4.4.1.2, 4.5.1.1, 4.5.1.3, 4.5.1.4, 4.6.1.1, 4.6.1.2, 4.7.2;
- removed subclauses 4.5.3, 4.6.2.3, 4.7.2;
- revised and updated Table 1.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

## Introduction

This document is a harmonized standard to provide one means for limiting and indicating devices for cranes to conform with the essential health and safety requirements of the Machinery Directive, as mentioned in Annex ZA.

This European Standard is a type-C standard as stated in EN 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 organizations, market surveillance etc.).

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);
- 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.

The machinery concerned and the extent to which hazards are covered are indicated in the scope of this standard.

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

<https://standards.iteh.ai/catalog/standards/sist/64226a5d-e16e-4d7c-aec5-e399bc6ab873/osist-pren-12077-2-2023>

## 1 Scope

This document specifies general requirements for limiting and indicating devices used in cranes. These devices restrict operation or provide operational information for the operator or other persons. Specific requirements for particular types of cranes are given in the appropriate European Standard for the particular crane type.

This document does not cover erection, dismantling, or changing the configuration of a crane.

The hazards covered by this document are identified in Annex A.

This document is applicable to cranes which are manufactured after the date of approval by CEN of 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.

EN 614-2:2000+A1:2008, *Safety of machinery - Ergonomic design principles - Part 2: Interactions between design of machinery and work tasks*

EN 60204-32:2008, *Safety of machinery - Electrical equipment of machines - Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*

EN 61310-1:2008, *Safety of machinery - Indication, marking and actuation - Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN ISO 12100:2010, *Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2023, *Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design (ISO 13849-1:2023)*

ISO 4306-1:2007, *Cranes - Vocabulary - Part 1: General*

## 3 Terms and definitions

For the purposes of this document the terms and definitions given in EN ISO 12100:2010, ISO 4306-1:2007 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp/>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### **anti-collision device**

device to prevent two moving parts from colliding

Note 1 to entry: A working space limiter can perform the function of an anti-collision device.

**prEN 12077-2:2023 (E)****3.2****configuration**

combination of structural members, counterweights, support or outrigger position, hook block reeving and similar items assembled, positioned and erected according to manufacturers' instructions and ready for operation

**3.3****continuous warning**

warning that is given visually by either a flashing or uninterrupted light, or acoustic by either a pulsing or uninterrupted sound, and persists throughout the time the condition being indicated exists

**3.4****control station position limiter**

device to prevent movement of the powered control station beyond specified limits

**3.5****derricking limiter**

device to prevent the raising or lowering of a boom, jib, fly jib, "A-frame" or mast beyond specified limits

**3.6****hoisting limiter**

device to prevent either the load lifting attachment from being raised such that it inadvertently strikes the crane structure, or any other specified upper limitation of the load lifting attachment from being exceeded

**3.7****indicator**

device to provide warnings and/or data to facilitate control of the crane within its design parameters

**3.8****lowering limiter**

device to ensure the minimum engagement of the lifting medium, e.g. the minimum number of turns of rope on the hoist drum, or mechanical device to prevent the chain from running out of engagement with the driving mechanism

**3.9****motion limiter**

device to initiate the stopping of motion or restrict crane movement

Note 1 to entry: See examples in 4.6.1.1.

**3.10****overturning moment**

mathematical product of the load and horizontal distance between a vertical line through the centre of gravity of a load and the corresponding tipping line

**3.11****performance limiter**

device to prevent a design performance characteristic from being exceeded

**3.12****rated capacity**

maximum net load or, for mobile cranes, hoist medium load that the crane is designed to lift for a given crane configuration and load location during operation



**3.13****rated capacity indicator**

device to indicate that the lifted load exceeds the rated capacity and that, in particular crane types, the lifted load approaches the rated capacity

**3.14****rated capacity limiter**

device to prevent the crane from handling loads in excess of its rated capacity

Note 1 to entry: Rated capacity limiter is also called as load limiter or lifting force limiter.

**3.15****slack rope limiter**

device to stop motion(s) in the event of the rope becoming slack

**3.16****slewing limiter**

device to prevent slewing beyond specified limits

**3.17****telescoping limiter**

device to prevent the extension or retraction of a part beyond specified limits

**3.18****travelling limiter**

device to prevent movement along tracks or runways beyond specified limits

Note 1 to entry: Travelling covers also traversing movement.

**3.19****working space limiter**

device to prevent any part of the crane from entering a prohibited space

Note 1 to entry: Working space limitation is often achieved by a combination of different limiters.

## 4 Safety requirements and/or measures

### 4.1 General

Machinery shall comply with the safety requirements and measures of Clause 4. In addition, the machine shall be designed according to the principles of EN ISO 12100:2010 for hazards relevant but not significant which are not dealt with by this standard.

### 4.2 Limiters and indicators

**4.2.1** The crane manufacturer shall select a device compatible with the intended use of the crane, taking the following into account:

- a) operating environment, e.g. relative humidity, temperature, condensation, vibration;
- b) rated capacity;
- c) crane characteristics;
- d) electromagnetic compatibility.

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**4.2.2** The installation of limiters and indicators shall be carried out in a manner that does not reduce the strength of the crane.

**4.2.3** The effects (e.g. forces, stopping distances) resulting from the operation of the limiter shall be within the design constraints of the crane.

**4.2.4** Systems shall enable periodic functional checks to be carried out to verify that indicators are operating correctly.

**4.2.5** If interruption of the power supply occurs, the settings of limiters and indicators shall be retained.

**4.2.6** Limiters and indicators shall be capable of withstanding the shock loads and vibrations transmitted to them during operation, erection, dismantling and maintenance of the crane.

**4.2.7** Limiters and indicators shall have legible and durable markings on or adjacent to them, preferably with symbols to indicate their function and mode of operation, and all indicators shall be compatible with ergonomic principles in accordance with EN 614-2:2000+A1:2008.

**4.2.8** Painting or other corrosion protection shall not affect the functioning of limiters and indicators.

**4.2.9** Limiters forming a part of a safety related control system shall be in accordance with EN ISO 13849-1:2023. The performance levels and categories used shall be those specified by the European Standards for particular crane types.

### **4.3 General requirement for rated capacity limiters and indicators**

**4.3.1** Rated capacity limiters and indicators shall be provided on all cranes having a rated capacity of 1 000 kg or above, or an overturning moment of 40 000 Nm or above due to the rated capacity (see 3.12).

**4.3.2** The rated capacity limiter and indicator shall perform in accordance with this standard for all rated capacities and all the configurations described in the information for use of the crane.

**4.3.3** If a crane can be operated with different configurations there shall be an indication of the crane configuration for which the rated capacity limiter and indicator has been set. Where a configuration selecting device is provided a direct description of the configuration selected shall be provided on the device, or a code which can be checked against a separate list of codes/configurations.

**4.3.4** The rated capacity limiter and indicator shall be designed to operate for all configurations and positions of the crane.

**4.3.5** Features shall be incorporated to minimize the risk of unintentional change of any manual setting device (e.g. by locking, double action).

**4.3.6** The number of setting positions of the configuration selection device(s) shall relate to the number of configurations provided for the crane. Positions which are not utilized shall render the crane inoperative or not cause an unsafe crane condition if selected.

**4.3.7** The design and installation of rated capacity indicators and rated capacity limiters shall allow for the possibility to test the crane with overloads without dismantling or permanently affecting the performance of the indicator or limiter. Where it is necessary to disconnect parts of the devices during testing, facilities shall be provided to check and/or reset the devices after the test.

## 4.4 Rated capacity limiters

### 4.4.1 General

**4.4.1.1** The rated capacity limiter shall prevent the crane from operating outside of the designed limits.

**4.4.1.2** The rated capacity limiter designed operating force shall be determined taking into account:

- a) the static force from the rated capacity;
- b) the dynamic part of the force from lifting the rated capacity;
- c) the tolerance of the force to operate the rated capacity limiter.

**4.4.1.3** The tolerance for the force to operate the limiter, shall be specified in the appropriate European Standard for the particular crane type. The objective shall be to ensure that the rated capacity limiter operates at as close to the rated capacity as is practicable.

### 4.4.2 Operating requirements

**4.4.2.1** When the load on the crane exceeds the rated capacity, the rated capacity limiter shall override the controls of the crane to prevent any condition that increases the overload.

NOTE Reference can be made to European Standards for particular crane types for details of motions that will increase the overload.

**4.4.2.2** The rated capacity limiter shall not prevent the crane operator from returning the controls to the neutral position and initiating actions that will move the crane to a reduced loading or unloaded condition.

**4.4.2.3** The rated capacity limiter, once triggered, shall continuously override the controls concerned until the overload has been removed and the relevant control lever has been returned to the neutral position.

## 4.5 Rated capacity indicators

### 4.5.1 Operating requirements

**4.5.1.1** The rated capacity indicator shall give visual or acoustic warnings or both, for all motions of the crane that induce a load in excess of the rated capacity as shown in the information supplied by the manufacturer for the particular crane.

**4.5.1.2** The rated capacity indicator shall:

- a) for those cranes where the rated capacity varies according to the position of the load, warn the crane operator when the rated capacity is approached;
- b) warn crane operators and persons in the danger zone when the rated capacity limiter is triggered;
- c) for those cranes where a limiter override is provided, warn the crane operators and persons in the danger zone whenever the rated capacity limiter has been overridden.