

SLOVENSKI SIST EN 1088:2000/oprA1:2005

PREDSTANDARD

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Varnost strojev - Zaporne naprave, povezane z varovali - Načela za načrtovanje in izbiro – Dopolnilo 1

Safety of machinery - Interlocking devices associated with guards - Principles for design and selection - DRAFT AMENDMENT 1: Design to minimize defeat possibilities

ICS 13.110

Referenčna številka
SIST EN 1088:2000/oprA1:2005(en)

ICS 13.110

English version

**Safety of machinery - Interlocking devices associated with
guards - Principles for design and selection - DRAFT
AMENDMENT 1: Design to minimize defeat possibilities**

Sécurité des machines - Dispositifs de verrouillage
associés à des protecteurs - Principes de conception et de
choix - PROJET AMENDEMENT 1: Conception réduisant
les possibilités de fraude

Sicherheit von Maschinen - Verriegelungseinrichtungen in
Verbindung mit trennenden Schutzeinrichtungen - Leitsätze
für Gestaltung und Auswahl - ÄNDERUNGSENTWURF 1:
Gestaltung zur Verringerung von Umgehungsmöglichkeiten

This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 114.

This draft amendment A1, if approved, will modify the European Standard EN 1088:1995. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment 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 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

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Foreword

This document (EN 1088:1995/prA1:2005) has been prepared by Technical Committee CEN/TC 114 "Safety of machinery", the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

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 Annex ZA, which is an integral part of this document.

This document corresponds to ISO 14119:1998/DAM1:2004 prepared by Technical Committee ISO/TC 199 "Safety of machinery" (Secretariat: DIN), which is currently submitted to DIS vote. It is foreseen to deal with the comments received on both enquiries in the same WG of ISO/TC 199, in parallel.

The aim of this document is the specification of more precise requirements in order to improve the provisions for minimizing defeat possibilities.

Changed text — DRAFT AMENDMENT TO EN 1088:1995

Delete 5.7 "Design to minimize defeat possibilities" and substitute as follows:

5.7 Design to minimize defeat possibilities

5.7.1 General

Interlocking devices shall be designed and instructions for their installation and maintenance shall be given so that they cannot be defeated in a simple manner.

NOTE "Defeat in a simple manner" means "intended operation achieved manually or with a readily available object". Readily available objects may be :

- screws, needles, sheet-metal pieces;
- objects in daily use such as keys and coins;
- spare actuators or spare keys for the trapped-key interlocking devices;
- tools required by the intended use of the machine or readily available tools (e.g. screwdrivers, wrenches, hexagonal keys and pliers).

"Defeat in a simple manner" includes the release of switches or actuators with the help of the above-mentioned tools, with the intention to disable an interlocking device.

Provisions by which defeat may be made more difficult shall include at least one of the following measures:

- a) provisions expressed in 5.2.2;
- b) the use of interlocking devices or systems which are coded, e.g. mechanically, electrically, magnetically or optically;
- c) physical obstruction or shielding preventing access to the interlocking device while the guard is open (see examples in Figures 5 and 6 and in Annex F, variant b);
- d) technical control measures expressed in 3.5;
- e) provision of additional position detectors in accordance with Figure 4 (see 5.4.1);
- f) other equivalent measures.

Where interlocking systems rely on special actuators or keys (coded or not), advice should be given in the instruction handbook concerning risks associated with the availability of spare actuators or keys and master keys.

5.7.2 Design to minimize defeat of mechanically actuated position detectors

5.7.2.1 Cam-operated position detectors

When a single detector is used, it shall be actuated in the positive mode (see 5.1) since, among other characteristics, this mode of actuation prevents the detector from being defeated in a simple manner.

Furthermore, simple release and turning away of the detector shall be made more difficult by means of fixtures which cannot easily be released.

NOTE A higher level of protection against defeat can be achieved, e.g., by enclosing the cam and detector in the same housing.

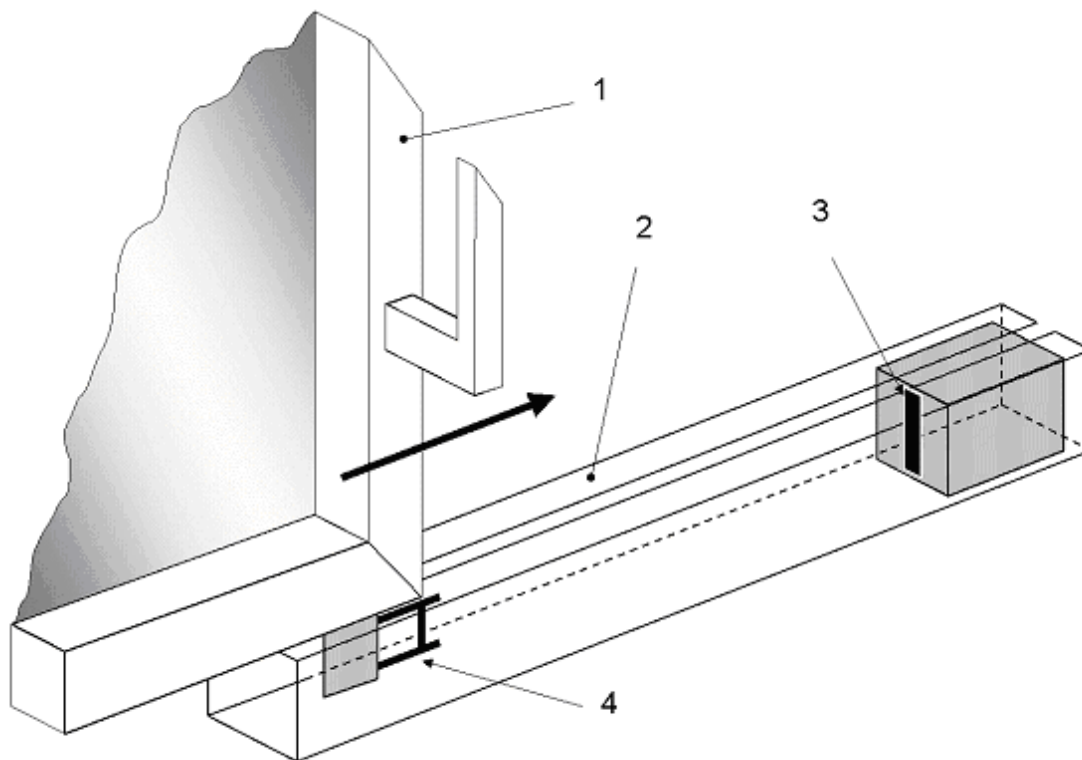
5.7.2.2 Tongue-operated switches

As the dependability of the switch relies heavily upon the design of the tongue and mechanism, the switch shall incorporate a system or systems to render it difficult to “defeat in a simple manner”.

NOTE For “defeat in a simple manner” see 5.7.1.

Furthermore, defeat with the help of a separate or dismantled actuator shall be made more difficult by at least one of the following measures:

- a) physical obstruction or shielding (see Figure 5);
- b) not easily separable assembly, e.g. by welding, riveting, “one-way” screws;
- c) use of position detectors with individual coding;
- d) technical control measures, e.g. start-up testing, cyclical testing (see 3.5);
- e) equivalent devices which make defeat with the help of a separate or dismantled actuator more difficult.



Key

- 1 sliding Guard (open)
- 2 cover (fixed part)
- 3 switch
- 4 tongue

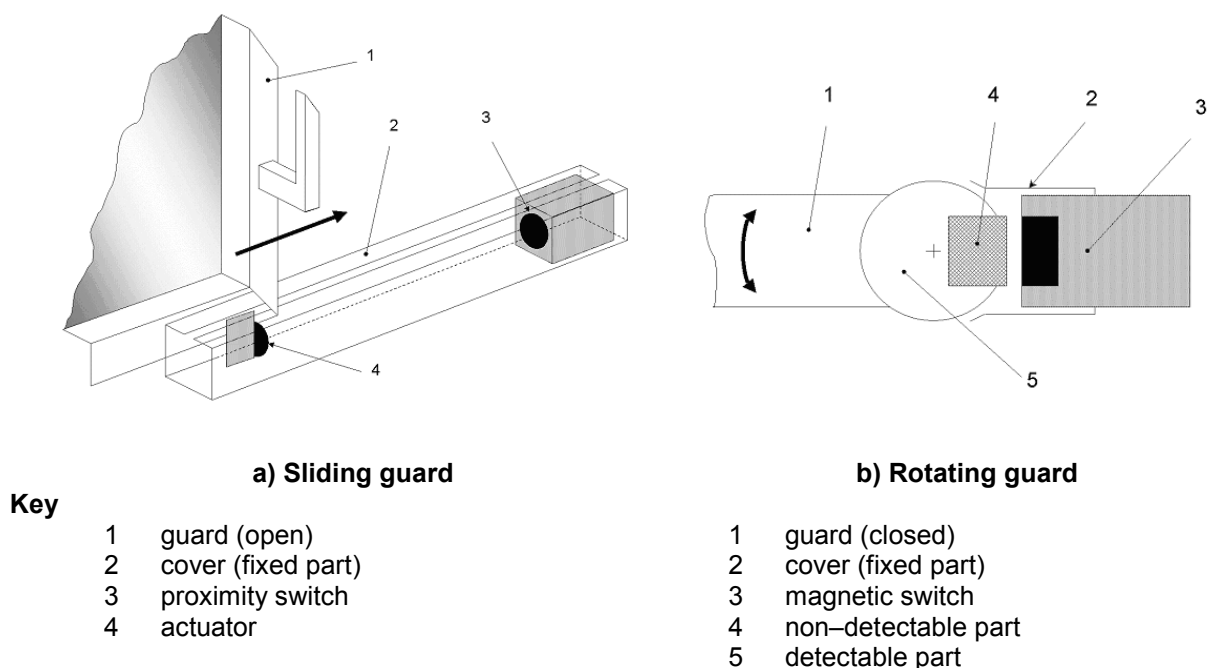
Figure 5 — Example of protection against defeating a tongue-operated switch

5.7.3 Design to minimize defeat of proximity switches and magnetic switches

Proximity switches and magnetic switches, which rely solely on the presence or absence of detectable material or of a magnet for their actuation, can easily be defeated. Therefore, their method of mounting shall give protection against defeat (see Figure 6).

NOTE See also 6.3.1 and the standard (in course of preparation) entitled "Proximity devices with fault prevention measures or defined behaviour under fault conditions" (see bibliography).

Where there is a risk of a substitute actuator being used to defeat the system, an obstruction shall be incorporated into the mechanical arrangement to prevent the substitute actuator being used to actuate the switch (see Figure 6).



NOTE Defeating the detector is made difficult by the presence of the guard in front of it.

Figure 6 — Examples of protection against defeat of a proximity switch or magnetic switch

5.7.4 Design to minimize defeat of plug and socket interlocking devices

Protection against defeat shall be achieved by means of at least one of the following measures:

- by locating the socket so that access to it is prevented when the guard is open [see example in Annex F, variant b)];
- by using a multi-pin plug and socket system the wiring of which, being hidden, makes it difficult to restore the continuity of the circuit [(see example in Annex F, variant a)];
- by using a plug and a socket system specifically designed for every particular application, or the spare parts of which are not readily available;
- other equivalent measures.

NOTE The wiring shown in Figures F.1 and F.2 (designated the "ring circuit") makes it necessary to use an additional wire with a plug and a socket at its ends in order to restore the continuity of the circuit when the guard is open; this contributes to prevent defeat.

Annex ZA
(informative)

**Relationship between this European Standard and the Essential Requirements of
EU Directive 98/37/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 Machinery 98/37/EC, amended by 98/79 EC.

Once this standard is cited in the Official Journal of the European Communities 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 given in table ZA confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding 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.