SLOVENSKI STANDARD
SIST EN ISO 16092-3:2018

01-junij-2018

Nadomešča:
SIST EN 693:2001+A2:2011

Varnost obdelovalnih strojev - Stiskalnice - 3. del: Varnostne zahteve za hidravlične stiskalnice (ISO 16092-3:2017)

Machine tools safety - Presses - Part 3: Sarety requirements for hydraulic presses (ISO 16092-3:2017)

Werkzeugmaschinen Sicherheit - Pressen - Teil 3: Sicherheitsanforderungen für hydraulische Pressen (ISO 16092-3:2017)

Sécurité des machines-outils - Presses - Partie 3: Exigences de sécurité pour les presses hydrauliques (ISO 16092-3:2017)

Ta slovenski standard je istoveten z: **EN ISO 16092-3:2018**

ICS:

13.110	Varnost strojev	Safety of machinery
25.120.10	Kovaški stroji. Stiskalnice. Škarje	Forging equipment. Presses. Shears

SIST EN ISO 16092-3:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16092-3

February 2018

ICS 25.120.10

Supersedes EN 693:2001+A2:2011

English Version

Machine tools safety - Presses - Part 3: Safety requirements for hydraulic presses (ISO 16092-3:2017)

Sécurité des machines-outils - Presses - Partie 3: Exigences de sécurité pour les presses hydrauliques (ISO 16092-3:2017)

Werkzeugmaschinen Sicherheit - Pressen - Teil 3: Sicherheitsanforderungen für hydraulische Pressen (ISO 16092-3:2017)

This European Standard was approved by CEN on 24 November 2017.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN ISO 16092-3:2018 E

Contents

Page

European foreword

This document (EN ISO 16092-3:2018) has been prepared by Technical Committee ISO/TC 39 “Machine tools” in collaboration with Technical Committee CEN/TC 143 “Machine tools - Safety” the secretariat of which is held by SNV.

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 August 2018, and conflicting national standards shall be withdrawn at the latest by August 2018.

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 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.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 16092-3:2017 has been approved by CEN as EN ISO 16092-3:2018 without any modification.

Annex ZA
(informative)

Relationship between this European Standard and the essential requirements of Directive 2006/42/EC aimed to be covered

This European Standard has been prepared under a Commission's standardization request M/396/C(2007) to provide one voluntary means of conforming to essential requirements of EU Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery.

Once this standard is cited in the Official Journal of the European Union under that Directive, compliance with the normative clauses of this standard given in Table ZA.1 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.

Table ZA.1 — Correspondence between this European Standard and Directive 2006/42/EC

Essential Requirements of Directive 2006/42/EC	Clause(s)/sub-clause(s) of this EN	Remarks/Notes
Within the limits of the scope all relevant essential requirements are covered.	All normative clauses	To confer a presumption of conformity with the relevant essential requirements of Directive 2006/42/EC, this standard (providing general/common requirements for a whole machine family) has to be applied together with one of those standards as specified in the scope (providing specific requirements for a particular category of machinery within this family), once this standard is cited in the Official Journal of the European Communities under Directive 2006/42/EC.

WARNING 1 — Presumption of conformity stays valid only as long as a reference to this European standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult frequently the latest list published in the Official Journal of the European Union.

WARNING 2 — Other Union legislation may be applicable to the products falling within the scope of this standard.

INTERNATIONAL STANDARD

ISO 16092-3

First edition
2017-12

Machine tools safety — Presses —

Part 3: Safety requirements for hydraulic presses

Sécurité des machines-outils — Presses —

Partie 3: Exigences de sécurité pour les presses hydrauliques

Reference number
ISO 16092-3:2017(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

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 documents 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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 39, *Machine tools*, Subcommittee SC 10, *Safety*.

A list of all parts in the ISO 16092 series can be found on the ISO website.

Introduction

This document is a “Type C” standard as stated in ISO 12100.

It 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 by the above-mentioned stakeholder groups by means of this document:

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

— machine users/employees (e.g. trade unions, organizations for people with special needs);

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

— consumers (in case of machinery intended for use by consumers).

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

The machinery concerned and the extent to which hazards, hazardous situations or hazardous events are covered are indicated in the Scope of this document.

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.

This document is intended to be applied in addition to ISO 16092-1.

Machine tools safety — Presses —

Part 3:
Safety requirements for hydraulic presses

1 Scope

This document, in addition to ISO 16092-1, specifies the technical safety requirements and measures to be adopted by persons undertaking the design, manufacture and supply of hydraulic presses which are intended to work cold metal or material partly made up of cold metal.

The presses covered by this document range in size from small high-speed machines with a single operator producing small workpieces to large relatively slow-speed machines with several operators and large complex workpieces.

This document deals with all significant hazards relevant for hydraulic presses when they are used as intended and under the conditions of misuse which are reasonably foreseeable by the manufacturer (see Clause 4). All the phases of the lifetime of the machinery as described in ISO 12100:2010, 5.4 have been taken into consideration.

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

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

ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design*

ISO 16092-1:2017, *Machine tools safety — Presses — Part 1: General safety requirements*

IEC 60947-5-8, *Low-voltage switchgear and control gear — Part 5-8: Control circuit devices and switching elements — Three-position enabling switches*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 12100:2010, ISO 13849-1:2015, ISO 16092-1:2017 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
restraint valve
device which protects against a gravity fall of the slide/ram

4 List of significant hazards

This clause contains all the significant hazards, hazardous situations and events identified by risk assessment as significant for the machines defined in the scope and which require a specific action to eliminate or reduce the risk.

These hazards are listed in ISO 16092-1:2017, Table 1. Additional hazards are listed in Annex A, Table A.1.

5 Safety requirements and/or measures

5.1 General

Hydraulic presses shall comply with the safety requirements and/or protective/risk reduction measures of this clause. In addition, the machine shall be designed according to the principles of ISO 12100 for relevant but not significant hazards which are not dealt with by this document.

5.2 Basic design considerations

5.2.1 Hydraulic and pneumatic systems — Common features

ISO 16092-1:2017, 5.2.1 shall apply.

5.2.2 Pneumatic systems

ISO 16092-1:2017, 5.2.2 shall apply.

5.2.3 Hydraulic systems

In addition to requirements given in ISO 16092-1:2017, 5.2.3, the following shall apply.

5.2.3.1 Controlled gravity descent may be a deliberate design feature to facilitate rapid closing of the tools.

In such a case, all the oil in the cylinder supporting the slide/ram shall be passed through the main control valve or valves in a redundant and monitored system (see Table 1 and/or Table 2).

5.2.3.2 The circuit shall be protected by pressure limiting valves. These valves shall not be capable of alteration without the use of a tool. Also, they shall be set at a pressure which is no more than 10 % higher than the maximum operating pressure.

5.2.3.3 For down-stroking presses, provision shall be made to protect the cylinder and components containing the fluid in the lower part of the cylinder from damage due to pressure intensification. A relief valve used for this purpose shall be direct operated, sealed and locked against unauthorised adjustment, and shall be set at a pressure at least 10 % above the maximum system pressure so that it only opens in the case of a fault. The components it protects shall be designed to withstand the pressure at which the valve is set. The relief valve shall be constructed so that, if a single break in the spring occurs, the space between the windings remains less than one wire thickness. The spring shall be guided so as to maintain the function of the relief valve.

5.2.4 Electric systems

ISO 16092-1:2017, 5.2.4 shall apply.

5.3 Mechanical hazards in the tools area

5.3.1 Major danger zone

ISO 16092-1:2017, 5.3.1 shall apply.

5.3.2 Safeguarding measures

In addition to requirements given in ISO 16092-1:2017, 5.3.2, the following shall apply.

Slow closing speed used in combination with hold-to-run control devices shall not exceed 10 mm/s. The speed shall not be limited by adjustment of variable parameters (see Tables 1, 2 and Annex F). The hold-to-run control device shall consist of a single button/foot-pedal and shall fulfil the requirements of IEC 60947-5-8. For foot-pedals, the force shall not exceed 350 N for switching from position 2 to position 3.

5.3.3 Other safety requirements

ISO 16092-1:2017, 5.3.3 shall apply.

5.3.4 Release of trapped persons between the tools

ISO 16092-1:2017, 5.3.4 shall apply.

5.3.5 Release of persons trapped inside enclosed areas

ISO 16092-1:2017, 5.3.5 shall apply.

5.3.6 Prevention of gravity fall during maintenance or repair

In addition to requirements given in ISO 16092-1:2017, 5.3.6, the following shall apply.

5.3.6.1 On presses with an opening stroke length of more than 500 mm and a depth of table of more than 800 mm, a mechanical restraint device shall be permanently fixed and integrated with the press. It can be manually operated.

If an integrated device, when active, cannot be easily seen from the operator's position, an additional clear indication of the position of the device shall be provided.

5.3.6.2 Where the restraint device is provided as protection during production and is mechanically linked to a main guard which needs to be removed for maintenance purposes, additional mechanical restraint devices, which can be manually positioned where necessary, shall be provided.

5.3.7 Prevention of unintended gravity fall during production (down-stroking press)

5.3.7.1 Measures shall be provided to prevent an unintended gravity fall of the slide/ram in the production mode with manual or automatic feed or removal, see Tables 1 and 2. Such a fall can be due to a failure of the hydraulic system, mechanical failure or a failure of the electrical control system. In this case:

— a mechanical restraint device, or

— a hydraulic restraint device, as defined in 5.3.7.2, or

— a combination of a single valve hydraulic restraint device and a mechanical restraint device

shall be provided.