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Machines for underground mines - Safety requirements for hydraulic powered roof supports - Part 3: Hydraulic and electro hydraulic control systems

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1804-3:2020 sisaldab Euroopa standardi EN 1804-3:2020 ingliskeelset teksti.	This Estonian standard EVS-EN 1804-3:2020 consists of the English text of the European standard EN 1804-3:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.12.2020.	Date of Availability of the European standard is 23.12.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Machines for underground mines - Safety requirements for hydraulic powered roof supports - Part 3: Hydraulic and electro hydraulic control systems

Machines pour mines souterraines - Exigences de sécurité relatives aux soutènements marchants applicables aux piles - Partie 3 : Systèmes de commande hydrauliques et électro-hydrauliques

Maschinen für den Bergbau unter Tage - Sicherheitsanforderungen an hydraulischen Schreitausbau - Teil 3: Hydraulische und elektro-hydraulische Steuerungen

This European Standard was approved by CEN on 25 October 2020.

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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.

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

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European foreword

This document (EN 1804-3:2020) has been prepared by Technical Committee CEN/TC 196 “Mining machinery and equipment - Safety”, the secretariat of which is held by DIN.

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 June 2021, and conflicting national standards shall be withdrawn at the latest by June 2021.

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 1804-3:2006+A1:2010.

The main differences between this document and EN 1804-3:2006+A1:2010 are as follows:

a) Normative references (updated);

b) Terms and definitions (revised/modified/enhanced);

c) List of significant hazards (revised/enhanced) (see Annex B);

d) Requirements for automatic hydraulic functions (deleted);

e) Requirements for in- and inter-shield hose routing (added);

f) Requirements for pipe and hose assemblies (updated);

g) Requirements for type “A” valves (modified);

h) Requirements for electro hydraulic control systems (added);

i) List of verification tests (updated/enhanced);

j) Figures and pictures (revised/added).

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 organisations 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is a type C standard as stated in EN ISO 12100.

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

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);

— 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 the case of machinery intended for use by consumers).

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, 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. The extent to which hazards are covered is indicated in the scope of this document.

While preparing this document, it was assumed that:

— only trained and competent persons operate the machine;

— components without specific requirements are:

— designed in accordance with the usual engineering practice and calculation code;

— of sound mechanical construction;

— free of defects;

— components are kept in good working condition / order;

— a negotiation took place between the user and the manufacturer concerning the use of the machinery.

1 Scope

This document specifies the safety requirements for hydraulic and electro hydraulic control devices, including hydraulic valves and their control elements, valve combinations, control systems, pipes and hose assemblies, measuring devices, built-in pressure limiting and check valves in legs and rams and, as well emergency stop, start warning, blocking- and control unit when used as specified by the manufacturer or his authorized representative. Excluded are pressure generators, and internal valves of legs and rams (e.g. leg bottom valves, see EN 1804-2:2020).

NOTE Some components are dealt with in other parts of this standard.

This document applies to hydraulic and electro hydraulic control devices at ambient temperatures from –10 °C to 60 °C.

This document identifies and takes into account:

— possible hazards which can be caused by the operation of hydraulic and electro hydraulic control devices;

— areas and operating conditions which can create such hazards;

— hazardous situations which can cause injury or can be damaging to health;

— hazards which can be caused by firedamp and/or combustible dusts.

This document describes methods for the reduction of these hazards.

A list of significant hazards covered appears in Clause 4.

This document does not specify any additional requirements for:

— use in particularly corrosive environments;

— hazards occurring during construction, transportation, decommissioning;

— earthquakes.

A complete hydraulic powered roof support consists of the support units (EN 1804-1:2020), legs and support rams (EN 1804-2:2020) and the hydraulic and electro hydraulic controls (EN 1804-3:2020). Each part of this multipart document addresses the safety requirements of the components mentioned in the scopes of the respective parts of this multipart series.

This document is not applicable to hydraulic and electro hydraulic control systems manufactured before the date of its publication.

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 853:2015, *Rubber hoses and hose assemblies — Wire braid reinforced hydraulic type — Specification*

EN 854:2015, *Rubber hoses and hose assemblies — Textile reinforced hydraulic type — Specification*

EN 856:2015+AC:2019, *Rubber hoses and hose assemblies — Rubber-covered spiral wire reinforced hydraulic type — Specification*

EN 857:2015, *Rubber hoses and hose assemblies — Wire braid reinforced compact type for hydraulic applications — Specification*

EN 981:1996+A1:2008, *Safety of machinery — System of auditory and visual danger and information signals*

EN 1804-1:2020, *Machines for underground mines — Safety requirements for hydraulic powered roof supports — Part 1: Support units and general requirements*

EN 1804-2:2020, *Machines for underground mines — Safety requirements for hydraulic powered roof supports — Part 2: Power set legs and rams*

EN ISO 3949:2020, *Plastics hoses and hose assemblies — Textile-reinforced types for hydraulic applications — Specification (ISO 3949:2020)*

EN 62061:2005[1], *Safety of machinery — Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005 + A1:2012 + A2:2015)*

EN ISO 80079-36:2016[2], *Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements (ISO 80079-36:2016)*

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

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

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

EN ISO 13849-2:2012, *Safety of machinery — Safety-related parts of control systems — Part 2: Validation (ISO 13849-2:2012)*

EN ISO 13850:2015, *Safety of machinery — Emergency stop function — Principles for design (ISO 13850:2015)*

EN IEC 60079 (all parts), *Explosive atmospheres (IEC 60079)*

ISO 6805:2020, *Rubber hoses and hose assemblies for underground mining — Wire-reinforced hydraulic types for coal mining — Specification*

ISO 7745:2010, *Hydraulic fluid power — Fire-resistant (FR) fluids — Requirements and guidelines for use*

DIN 22100-5:2010, *Articles and materials from synthetic for use in underground mines — Part 5: Tubes, tube isolations and hoses — Safety requirements, testing, marking*

[1] As impacted by EN 62061:2005/A1:2013, EN 62061:2005/A2:2015 and EN 62061:2005/corrigendum Feb. 2012.
[2] As impacted by EN ISO 80079-36:2016/AC:2019.