



SLOVENSKI STANDARD

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Električni pogonski sistemi z nastavlljivo hitrostjo - 5-2. del: Varnostne zahteve - Funkcijske (IEC 61800-5-2:2016)

Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional (IEC 61800-5-2:2016)

Elektrische Leistungsantriebssysteme mit einstellbarer Drehzahl - Teil 5-2: Anforderungen an die Sicherheit - Funktionale Sicherheit (IEC 61800-5-2:2016)

Entraînements électriques de puissance à vitesse variable - Partie 5-2: Exigences de sécurité - Fonctionnelle (IEC 61800-5-2:2016)

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ICS:

13.110	Varnost strojev	Safety of machinery
29.200	Usmerniki. Pretvorniki. Stabilizirano električno napajanje	Rectifiers. Convertors. Stabilized power supply

SIST EN 61800-5-2:2017 en

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EUROPEAN STANDARD

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April 2017

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English Version

**Adjustable speed electrical power drive systems - Part 5-2:
Safety requirements - Functional
(IEC 61800-5-2:2016)**

Entraînements électriques de puissance à vitesse variable -
Partie 5-2: Exigences de sécurité - Fonctionnelle
(IEC 61800-5-2:2016)

Elektrische Leistungsantriebssysteme mit einstellbarer
Drehzahl - Teil 5-2: Anforderungen an die Sicherheit -
Funktionale Sicherheit
(IEC 61800-5-2:2016)

This European Standard was approved by CENELEC on 2016-05-23. CENELEC 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.

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SIST EN 61800-5-2:2017

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 61800-5-2:2017**European foreword**

The text of document 22G/332/FDIS, future edition 2 of IEC 61800-5-2, prepared by SC 22G "Adjustable speed electric drive systems incorporating semiconductor power converters" of IEC/TC 22 "Power electronic systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61800-5-2:2017.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2017-10-28
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2020-04-28

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The text of the International Standard IEC 61800-5-2:2016 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60300-3-1:2003	NOTE	Harmonized as 60300-3-1:2003.
IEC 60664-1:2007	NOTE	Harmonized as EN 60664-1:2007.
IEC 606643	NOTE	Harmonized as EN 60664-3.
IEC 61025	NOTE	Harmonized as EN 61025.
IEC 61078	NOTE	Harmonized as EN 61078.
IEC 61165	NOTE	Harmonized as EN 61165.
IEC 61508-4:2010	NOTE	Harmonized as EN 61508-4:2010.
IEC 61508-5:2010	NOTE	Harmonized as EN 61508-5:2010.
IEC 61511 (series)	NOTE	Harmonized as EN 61511 (series).
IEC 61511-1	NOTE	Harmonized as EN 61511-1.
IEC 61513	NOTE	Harmonized as EN 61513.
IEC 61558 (series)	NOTE	Harmonized as EN 61558 (series).
IEC 61558-1:2005	NOTE	Harmonized as EN 61558-1:2005.
IEC 61558-1:2005/AMD1:2009	NOTE	Harmonized as EN 61558-1:2005/A1:2009.

IEC 61784-3	NOTE	Harmonized as EN 61784-3.
IEC 62061	NOTE	Harmonized as EN 62061.
ISO 13849-2	NOTE	Harmonized as EN ISO 13849-2.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60204-1	-	Safety of machinery - Electrical equipment of machines -- Part 1: General requirements	EN 60204-1	-
IEC 61000-2-4	2002	Electromagnetic compatibility (EMC) -- Part 2-4: Environment - Compatibility levels in industrial plants for low-frequency conducted disturbances	EN 61000-2-4	2002
IEC 61000-4-2	2008	Electromagnetic compatibility (EMC) -- Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test	EN 61000-4-2	2009
IEC 61000-4-3	2006	Electromagnetic compatibility (EMC) -- Part 4-3: Testing and measurement techniques - Radiated, radio frequency, electromagnetic field immunity test	EN 61000-4-3	2006
+ A1	2007		+ A1	2008
+ A2	2010		+ A2	2010
IEC 61000-4-4	2012	Electromagnetic compatibility (EMC) -- Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	2012
IEC 61000-4-5	2014	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	2014
IEC 61000-4-6	2013	Electromagnetic compatibility (EMC) -- Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	2014
IEC 61000-4-29	2000	Electromagnetic compatibility (EMC) -- Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests	EN 61000-4-29	2000
IEC 61000-4-34	2005	Electromagnetic compatibility (EMC) -- Part 4-34: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16 A per phase	EN 61000-4-34	2007
IEC 61000-6-7	2014	Electromagnetic compatibility (EMC) - Part 6-7: Generic standards - Immunity requirements for equipment intended to perform functions in a safety-related system (functional safety) in industrial locations	EN 61000-6-7	2015

IEC 61400-21	2008	Wind turbines -- Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines	EN 61400-21	2008
IEC 61508-1	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 1: General requirements	EN 61508-1	2010
IEC 61508-2	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 2: Requirements for	EN 61508-2	2010
IEC 61508-3	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 3: Software requirements	EN 61508-3	2010
IEC 61508-6	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 6: Guidelines on the application of IEC 61508-2 and IEC 61508-3	EN 61508-6	2010
IEC 61508-7	2010	Functional safety of electrical/electronic/programmable electronic safety-related systems -- Part 7: Overview of techniques and measures	EN 61508-7	2010
IEC 61800-1	-	Adjustable speed electrical power drive systems -- Part 1: General requirements - Rating specifications for low voltage adjustable speed d.c. power drive systems	EN 61800-1	-
IEC 61800-2	2015	Adjustable speed electrical power drive systems -- Part 2: General requirements - Rating specifications for low voltage adjustable speed a.c. power drive systems	EN 61800-2	2015
IEC 61800-3	2004	Adjustable speed electrical power drive systems -- Part 3: EMC requirements and specific test methods	EN 61800-3	2004
IEC 61800-4	-	Adjustable speed electrical power drive systems -- Part 4: General requirements - Rating specifications for a.c. power drive systems above 1 000 V a.c. and not exceeding 35 kV	EN 61800-4	-
IEC 61800-5-1	2007	Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy	EN 61800-5-1	2007
ISO 13849-1	2006	Safety of machinery - Safety-related parts of control systems -- Part 1: General principles for design	-	-
ISO 13849-2	2012	Safety of machinery - Safety-related parts of control systems_ - Part_2: Validation	EN ISO 13849-2	2012

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INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Adjustable speed electrical power drive systems –
Part 5-2: Safety requirements – Functional**
(standards.iteh.ai)

**Entraînements électriques de puissance à vitesse variable –
Partie 5-2: Exigences de sécurité – Fonctionnelle**
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ADJUSTABLE SPEED ELECTRICAL
POWER DRIVE SYSTEMS –**
Part 5-2: Safety requirements – Functional

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 61800-5-2 has been prepared by subcommittee 22G: Adjustable speed electric drive systems incorporating semiconductor power converters, of IEC technical committee 22: Power electronic systems and equipment.

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) rational added in the scope why low demand mode is not covered by this standard
- b) definition added for: “*category*” and “*safety function*”
- c) “Other sub-functions” sorted into “Monitoring sub-functions” and “Output functions”
- d) deleted “proof test” throughout the document because for *PDS(SR)* a proof test is not applicable

- e) replaced the term “safety function” by “*safety sub-function*” throughout the document
- f) Updated references to IEC 61508 series Ed.2010
- g) Added the principle rules of ISO 13849-1 and reference to tables of ISO 13849-2
- h) 6.1.6 Text replaced by Table 2
- i) 6.1.7 Integrated circuits with on-chip redundancy matched to changed requirement in IEC 61508-2: 2010, Annex E
- j) 6.2.8 Design requirements for thermal immunity of a *PDS(SR)*
- k) 6.2.9 Design requirements for mechanical immunity of a *PDS(SR)*
- l) 6.1.6 *SIL* for multiple *safety sub-functions* within one *PDS(SR)*
- m) 6.1.7 Integrated circuits with on-chip redundancy
- n) 6.2.1 Basic and well-tried safety principles
- o) 6.2.2.1.4 *Diagnostic test* interval when the hardware fault tolerance is greater than zero
- p) 6.2.5.2.7 *PDS(SR)* parameterization
- q) 9 Test requirements
- r) 9.3 Electromagnetic (EM) immunity testing
- s) 9.4 Thermal immunity testing
- t) 9.5 Mechanical immunity testing
- u) Annex A Sequential task table
- v) Annex D, D.3.16, Motion and position feedback sensors updated
- w) Annex E Electromagnetic immunity (EM) requirement for *PDS(SR)*
- x) Annex F Estimation of PFD_{avg} value for low demand with given PFH value

The text of this standard is based on the following documents:

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FDIS	Report on voting
22G/332/FDIS	22G/335/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts of the IEC 61800 series, published under the general title *Adjustable speed electric drive systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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