



SLOVENSKI STANDARD

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Električni pogonski sistemi z nastavljivo hitrostjo - 2. del: Splošne zahteve - Razvrstilne specifikacije za nizkonapetostne izmenične pogonske sisteme z nastavljivo hitrostjo

Adjustable speed electrical power drive systems - Part 2: General requirements - Rating specifications for low voltage adjustable speed a.c. power drive systems

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ICS:

29.200

Usmerniki. Pretvorniki.
Stabilizirano električno
napajanje

Rectifiers. Convertors.
Stabilized power supply

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EUROPEAN STANDARD

EN 61800-2

NORME EUROPÉENNE

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**Adjustable speed electrical power drive systems -
Part 2: General requirements - Rating specifications for low
voltage adjustable speed a.c. power drive systems
(IEC 61800-2:2015)**

Entraînements électriques de puissance à vitesse variable -
Partie 2: Exigences générales - Spécifications de
dimensionnement pour systèmes d'entraînement de
puissance à vitesse variable en courant alternatif et basse
tension
(IEC 61800-2:2015)

Drehzahlveränderbare elektrische Antriebe -
Teil 2: Allgemeine Anforderungen - Festlegungen für die
Bemessung von Niederspannungs-Wechselstrom-
Antriebssystemen mit einstellbarer Frequenz
(IEC 61800-2:2015)

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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 61800-2:2015**European foreword**

The text of document 22G/303/FDIS, future edition 2 of IEC 61800-2, 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 61800-2:2015.

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) 2016-05-26
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2018-08-26

This document supersedes EN 61800-2:1998.

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The text of the International Standard IEC 61800-2:2015 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 60027-3	NOTE	Harmonized as EN 60027-3.
IEC 60034-1	NOTE	Harmonized as EN 60034-1.
IEC 60204-1	NOTE	Harmonized as EN 60204-1.
IEC 60364 Series	NOTE	Harmonized as HD 60364 Series.
IEC 61131-2	NOTE	Harmonized as EN 61131-2.
IEC 61158 Series	NOTE	Harmonized as EN 61158 Series.
IEC 61158-1	NOTE	Harmonized as EN 61158-1.
IEC 61158-2	NOTE	Harmonized as EN 61158-2.
IEC 61378-1	NOTE	Harmonized as EN 61378-1.
IEC 61439-1	NOTE	Harmonized as EN 61439-1.
IEC 61800-1	NOTE	Harmonized as EN 61800-1.
IEC 61800-4	NOTE	Harmonized as EN 61800-4.

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 60034-9	-	Rotating electrical machines - Part 9: Noise limits	EN 60034-9	-
IEC 60038	-	IEC standard voltages	EN 60038	-
IEC 60050	Series	International Electrotechnical Vocabulary	-	-
IEC 60068	series	Environmental testing	EN 60068	Series
IEC 60068-2-2	2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	2007
IEC 60068-2-6	2007	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	2008
IEC 60068-2-27	2008	Environmental testing - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	2009
IEC 60068-2-52	1996	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN 60068-2-52	1996
IEC 60068-2-68	1994	Environmental testing - Part 2-68: Tests - Test L: Dust and sand	EN 60068-2-68	1996
IEC 60068-2-78	2012	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	2013
IEC 60079	Series	Explosive atmospheres	EN 60079	Series
IEC 60146-1-1	-	Semiconductor converters - General requirements and line commutated converters - Part 1-1: Specification of basic requirements	EN 60146-1-1	-
IEC/TR 60146-1-2	-	Semiconductor converters - General requirements and line commutated converters - Part 1-2: Application guide	-	-
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-

EN 61800-2:2015

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60664-1	-	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	-
IEC 60721-3-1	1997	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 1: Storage	EN 60721-3-1	1997
IEC 60721-3-2	1997	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities -- Section 2: Transportation	EN 60721-3-2	1997
IEC 60721-3-3	1994	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	1995
+A1	1995			
+A2	1996		+A2	1997
IEC 60721-3-4	1995	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 4: Stationary use at non-weatherprotected locations	EN 60721-3-4	1995
+A1	1996		+A1	1997
IEC 61800-3	-	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods	EN 61800-3	-
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
IEC 61800-5-2	2007	Adjustable speed electrical power drive systems - Part 5-2: Safety requirements - Functional	EN 61800-5-2	2007
IEC/TR 61800-6	-	Adjustable speed electrical power drive systems - Part 6: Guide for determination of types of load duty and corresponding current ratings	CLC/TR 61800-6	-
IEC 61800-7	Series	Adjustable speed electrical power drive systems - Part 7: Generic interface and use of profiles for power drive systems	EN 61800-7	Series
IEC 61800-7-1	-	Adjustable speed electrical power drive systems - Part 7-1: Generic interface and use of profiles for power drive systems - Interface definition	EN 61800-7-1	-



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Edition 2.0 2015-07

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Adjustable speed electrical power drive systems –
Part 2: General requirements – Rating specifications for low voltage adjustable
speed a.c. power drive systems**

**Entraînements électriques de puissance à vitesse variable –
Partie 2: Exigences générales – Specifications de dimensionnement pour
systèmes d'entraînement de puissance à vitesse variable en courant alternatif et
basse tension**

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	10
2 Normative references	11
3 Terms and definitions	12
4 Ratings and specifications for the act of installing, commissioning and operation	28
4.1 General.....	28
4.2 <i>BDM/CDM/PDS</i> characteristics and topology	29
4.2.1 General	29
4.2.2 <i>BDM/CDM/PDS</i> characteristics	29
4.2.3 Basic topology for <i>BDM/CDM/PDS</i> 's	30
4.3 Ratings	33
4.3.1 General	33
4.3.2 Input ratings	34
4.3.3 Output ratings.....	35
4.3.4 Operating <i>quadrants</i>	37
4.3.5 Ratings and properties of the control equipment	37
4.3.6 Special ratings related to <i>BDM/CDM/PDS</i> or <i>motor</i>	37
4.4 Performance	38
4.4.1 Operational.....	38
4.4.2 Fault supervision	47
4.4.3 Minimum status indication required	47
4.4.4 I/O devices	47
4.5 Electrical safety	49
4.6 Functional safety	49
4.7 EMC	50
4.8 Eco design.....	50
4.8.1 General	50
4.8.2 Energy <i>efficiency</i> and losses	50
4.8.3 Environmental impact	50
4.9 Environmental condition for service, transport and storage	51
4.9.1 General	51
4.9.2 Operation	51
4.9.3 Storage and transport of equipment.....	56
4.9.4 Environmental service tests (<i>type test</i>)	57
4.10 Types of load duty profiles	58
4.11 Generic interface and use of profiles for <i>PDS</i>	58
4.12 Voltage on <i>power interface</i>	60
4.13 Explosive environment	61
5 Test.....	61
5.1 General.....	61
5.2 Performance of tests.....	61
5.2.1 General conditions.....	61
5.2.2 Supply system earthing conditions.....	61
5.3 Standard tests for <i>BDM/CDM/PDS</i>	62
5.3.1 General	62

5.3.2	Test for mass produced products	63
5.3.3	Test for one-off products	63
5.4	Test specifications	64
5.4.1	Visual inspections (<i>type test, sample test and routine test</i>)	64
5.4.2	Static performance and rating test	64
5.4.3	Electrical safety	70
5.4.4	Functional safety	70
5.4.5	EMC	70
5.4.6	Eco-design	71
5.4.7	Environmental condition tests	71
5.4.8	Communication profiles	76
5.4.9	Explosive atmosphere environment	77
6	Information and marking requirements	77
6.1	General	77
6.2	Marking on product	78
6.3	Information to be supplied with the <i>PDS</i> or <i>BDM/CDM</i>	79
6.4	Information to be supplied or made available	79
6.5	Safety and warning labels	79
6.5.1	Warning labels	79
6.5.2	Additional safety considerations of a <i>PDS</i>	79
Annex A (informative)	Classification of <i>PDS</i> into low-voltage system and high-voltage system	81
A.1	General	81
A.2	Classification of <i>PDS</i> by voltage	81
A.3	Examples	82
A.3.1	<i>PDS</i> with an input transformer	82
A.3.2	<i>PDS</i> with an input transformer and an output transformer	82
A.3.3	<i>PDS</i> with a step-up chopper	83
A.3.4	<i>PDS</i> with parallel-connected line-side <i>converters</i>	83
A.3.5	<i>PDS</i> with series-connected line-side <i>converters</i>	84
A.3.6	<i>PDS</i> with star-connected <i>inverters</i>	85
A.3.7	<i>PDS</i> with a multilevel <i>inverter</i>	86
Annex B (informative)	Determination of the <i>input current</i> of <i>BDM/CDM/PDS</i>	88
Bibliography	90
Figure 1	– (<i>BDM/CDM/PDS</i>) manufacturer/customer relationship	15
Figure 2	– Example of a <i>power drive system</i>	25
Figure 3	– Operating <i>quadrants</i>	28
Figure 4	– Typical <i>BDM/CDM/PDS</i>	31
Figure 5	– Common d.c.link <i>BDM/CDM/PDS</i>	31
Figure 6	– <i>BDM/CDM/PDS</i> with brake	32
Figure 7	– <i>BDM/CDM/PDS</i> with AIC	33
Figure 8	– Example of operating region of a <i>PDS</i>	35
Figure 9	– Overload cycle example	36
Figure 10	– Deviation band	39
Figure 11	– Time response following a step change of reference input no change in operating variables	42

Figure 12 – Time response following a change in an operating variable – no reference change.....	43
Figure 13 – Time response following a reference change at specified rate.....	44
Figure 14 – Frequency response of the control – Reference value as <i>stimulus</i>	45
Figure 15 – Example of relationship of IEC 61800-7 series to control system software and the <i>BDM/CDM/PDS</i>	60
Figure 16 – Measuring circuit of <i>PDS</i>	65
Figure A.1 – Basic configuration of <i>PDS</i>	81
Figure A.2 – An example of low-voltage <i>PDS</i> with an input transformer.....	82
Figure A.3 – An example of low-voltage <i>PDS</i> with an input/output transformer.....	83
Figure A.4 – An example of low-voltage <i>PDS</i> with a step-up chopper.....	83
Figure A.5 – An example of low-voltage <i>PDS</i> with parallel-connected <i>rectifiers</i>	84
Figure A.6 – An example of high-voltage <i>PDS</i> with parallel-connected line-side <i>converters</i>	84
Figure A.7 – An example of low-voltage <i>PDS</i> with series-connected <i>rectifiers</i>	85
Figure A.8 – An example of high-voltage <i>PDS</i> with series-connected <i>rectifiers</i>	85
Figure A.9 – An example of high-voltage <i>PDS</i> with star-connected <i>inverters</i>	86
Figure A.10 – An example of high-voltage <i>PDS</i> with a multilevel <i>inverter</i>	87
Figure A.11 – An example of a power module.....	87
Figure B.1 – Example of distortion effect of the <i>input current</i> affected by a three-phase <i>converter</i> with capacitive load.....	88
Table 1 – List of terms.....	13
Table 2 – List of input ratings of <i>BDM/CDM/PDS</i>	13
Table 3 – List of output ratings of <i>BDM/CDM/PDS</i>	14
Table 4 – List of motor speed and torque ratings.....	14
Table 5 – Overview of input and output ratings of the <i>BDM/CDM/PDS</i>	33
Table 6 – Standard voltages as specified in IEC 60038.....	34
Table 7 – Example of reduced maximum continuous load as a function of an overload.....	36
Table 8 – Maximum deviation bands (percent).....	39
Table 9 – Environmental service conditions.....	52
Table 10 – Limit of temperature of the cooling medium for indoor equipment.....	53
Table 11 – Definitions of pollution degree.....	53
Table 12 – Environmental vibration limits for fixed <i>installation</i>	54
Table 13 – Environmental shock limits for fixed <i>installation</i>	54
Table 14 – Storage and transport limits.....	56
Table 15 – Transportation vibration limits.....	57
Table 16 – Transportation limits of free fall.....	57
Table 17 – Environmental service tests.....	58
Table 18 – Test overview.....	62
Table 19 – Dry heat test (steady state).....	72
Table 20 – Damp heat test (steady state).....	73
Table 21 – Vibration test.....	74
Table 22 – Shock test.....	74

Table 23 – Salt mist test	75
Table 24 – Dust test.....	75
Table 25 – Sand test.....	76
Table 26 – Water test	76
Table 27 – Information requirements.....	78
Table A.1 – Basic classification of <i>PDS</i> by voltage.....	82

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ADJUSTABLE SPEED ELECTRICAL
POWER DRIVE SYSTEMS –****Part 2: General requirements –
Rating specifications for low voltage
adjustable speed a.c. power drive systems**

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 61800-2 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 1998. This edition constitutes a technical revision.

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

- a) Clause 1 (Scope) has been updated
- b) Clause 2 (Normative references) has been updated

- c) Clause 3 (Definitions) has been updated including fundamental definitions to be used across the IEC 61800 series of standards.
- d) Clause 4 has been updated with respect to:
- 1) description of the basic topology for *BDM/CDM/PDS* (4.2);
 - 2) ratings and performance (4.3 and 4.4);
 - 3) reference to applicable standards within the IEC 61800 series with respect to EMC (IEC 61800-3), Electrical safety (IEC 61800-5-1), Functional safety (IEC 61800-5-2), Load duty aspects (IEC TR 61800-6), Communication profiles (IEC 61800-7 series) and *Power interface* voltage (IEC TS 61800-8) to avoid conflicting requirements. (4.5, 4.6, 4.7, 4.10, 4.11, 4.12,);
 - 4) update of requirement for ECO design (4.8);
 - 5) update of requirement for environmental evaluation. (4.9);
 - 6) implementation of requirement for explosive atmosphere (4.13).
- e) Clause 5 has been updated with test requirement in order to provide a clear link between design requirement and test requirement.
- f) Clause 6 has been updated to harmonize the marking and documentation requirement within the IEC 61800 series.
- g) Existing Annexes A to G have been deleted and replaced with new Annexes A to C.

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

FDIS Report on voting	
22G/303/FDIS	22G/305/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 in the IEC 61800 series, published under the general title *Adjustable speed electrical power drive systems*, can be found on the IEC website.

In this standard, the terms in *italics* are defined in Clause 3.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

0.1 General

This document is part of the IEC 61800 series specifying requirements for adjustable speed electric drive systems (*PDS*). Since the publication of the first edition of IEC 61800-2 several documents of the IEC 61800 have been developed and maintained, which has resulted in outdated references and conflicting requirements across the IEC 61800 series.

This document contains general requirements for *PDSs* intended to feed a.c. *motors* and with rated *converter* input voltages (line-to-line voltage) up to 1 000 V a.c.

PDSs intended to feed a.c. *motors* with rated *converter input* voltages above 1 000 V a.c. are covered by IEC 61800-4.

PDSs intended to feed d.c. *motors* are covered by IEC 61800-1.

0.2 Consistency of requirement

This document specifies requirements for *PDSs* under its scope for the identified topics not covered by any other of the standards in the IEC 61800 series.

The following requirements are covered by other standards in the IEC 61800 series:

- EMC requirements are covered in IEC 61800-3;
- electrical safety requirements are covered in IEC 61800-5-1;
- functional safety requirements are covered in IEC 61800-5-2;
- type of load duty requirements are covered by IEC TR 61800-6;
- communication profiles aspects which are covered by IEC 61800-7 series;
- *power interface* voltage specification is specified in IEC TS 61800-8.

Generally this document provides a basic description of topics and refers to the relevant standard for specific requirement. This is done in order to ensure consistency and avoid conflicting requirement within the IEC 61800 series as well as minimize future maintenance of the documents.

As part of the work inside SC22G MT9 this edition of IEC61800-2 defines basic definition as used across the IEC 61800 series of standards.

For issues related to *active infeed converters*, IEC TS 62578 has been considered.

At the time of writing IEC SC 22G is developing a standard to provide requirement for energy *efficiency* for *BDM/CDM/PDS*. The next edition of IEC 61800-2 will reference this standard similar to the approach taken with the other IEC 61800 series standards.

As a result of the development of the IEC 61800 series of standards the need to reference documents outside the series has decreased and especially the need to reference the IEC 60146 series of standards has decreased dramatically.

0.3 Tool for agreement between *customer* and *manufacturer*

This document is intended to be used to create a comprehensive list of requirements to be used as a specification between *customer* and *manufacturer*. The requirement in this document is in itself not applicable for the *BDM/CDM/PDS*. Instead each topic should be specified by the *customer* as a compliance requirement.

The document may be useful as a specification tool, when *BDM/CDM/PDSs* are built into a final *installation* or application applied as a component. The following applications are considered relevant: lift and hoist, machinery, conveyor, switchgears, heating and ventilation, pump, wind, tidal and marine propulsion applications.

In every application, an identification of the environmental conditions under which the product is stored, transported and operated is essential for the proper specification of the *BDM/CDM/PDSs*. The environmental conditions considered should include electrical, mechanical, thermal, pollution and humidity environmental condition.

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