IEC 61800-5-2

Edition 2.1 2026-10

INTERNATIONAL STANDARD

CONSOLIDATED VERSION

Adjustable speed electrical power drive systems -
Part 5-2: Safety requirements - Functional

ICS 29.200; 29.130.99; 13.110

ISBN 978-2-8327-1593-2

IEC 61800-5-2:2016-04+AMD1:2026-10 CSV(en)

THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2026 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC Products & Services Portal - products.iec.ch
Discover our powerful search engine and read freely all the publications previews, graphical symbols and the glossary. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 500 terminological entries in English and French, with equivalent terms in 25 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD 5
1 Scope 9
2 Normative references 10
3 Terms and definitions 12
4 Designated *safety sub-functions* 19
4.1 General 19
4.2 *Safety sub-functions* 19
4.2.1 General 19
4.2.2 Limit values 20
4.2.3 Stopping functions 20
4.2.4 Monitoring functions 22
4.2.5 Output functions – Safe brake control (SBC) 23
5 Management of *functional safety* 23
5.1 Objective 23
5.2 Requirements for the management of *functional safety* 23
5.3 *PDS(SR)* development lifecycle 24
5.4 Planning of *PDS(SR) functional safety* management 24
5.5 Safety requirements specification (*SRS*) for a *PDS(SR)* 26
5.5.1 General 26
5.5.2 *Safety sub-functions* requirements specification 27
5.5.3 *Safety integrity* requirements specification 27
5.6 *PDS(SR)* safety system architecture specification 28
5.6.1 General 28
5.6.2 Requirements for safety system architecture specification 28
6 Requirements for design and development of a *PDS(SR)* 29
6.1 General requirements 29
6.1.1 Change in operational status 29
6.1.2 Design standards 29
6.1.3 Realisation 29
6.1.4 *Safety integrity* and fault detection 30
6.1.5 Safety and non-*safety sub-functions* 30
6.1.6 *SIL* for multiple *safety sub-function*s within one *PDS(SR)* 30
6.1.7 Integrated circuits with on-chip redundancy 31
6.1.8 Software requirements 31
6.1.9 Design documentation 31
6.2 *PDS(SR)* design requirements 31
6.2.1 Basic and well-tried safety principles 31
6.2.2 Requirements for the estimation of the probability of dangerous random hardware failures per hour (*PFH*) 32
6.2.3 Architectural constraints 34
6.2.4 Estimation of *safe failure fraction (SFF)* 36
6.2.5 Requirements for *systematic safety integrity* of a *PDS(SR)* and *PDS(SR) subsystem*s 36
6.2.6 Design requirements for electromagnetic (EM) immunity of a *PDS(SR)* 39
6.2.7 Design requirements for thermal immunity of a *PDS(SR)* 39
6.2.8 Design requirements for mechanical immunity of a *PDS(SR)* 39
6.3 Behaviour on detection of fault 40

6.3.1 Fault detection 40
6.3.2 Fault tolerance greater than zero 40
6.3.3 Fault tolerance zero 40
6.4 Additional requirements for data communications 40
6.5 *PDS(SR)* integration and testing requirements 40
6.5.1 Hardware integration 40
6.5.2 Software integration 40
6.5.3 Modifications during integration 41
6.5.4 Applicable integration tests 41
6.5.5 Test documentation 41
6.6 Security requirements 41
6.7 Requirements regarding fully or partially self-evolving control logic 41
7 Information for use 41
7.1 General 41
7.2 Information and instructions for safe application of a *PDS(SR)* 41
8 *Verification* and *validation* 43
8.1 General 43
8.2 *Verification* 43
8.3 *Validation* 43
8.4 Documentation 44
9 Test requirements 44
9.1 Planning of tests 44
9.2 Functional testing 44
9.3 Electromagnetic (EM) immunity testing 44
9.3.1 General 44
9.3.2 Intended EM environment 44
9.3.3 Performance criterion (fail safe state – FS) 45
9.4 Thermal immunity testing 45
9.4.1 General 45
9.4.2 Functional thermal test 45
9.4.3 Component thermal test 45
9.5 Mechanical immunity testing 46
9.5.1 General 46
9.5.2 Vibration test 46
9.5.3 Shock test 46
~~9.5.4 Performance criterion for mechanical immunity tests (fail safe state – FS) .....~~
9.6 Test documentation 46
10 Modification 46
10.1 Objective 46
10.2 Requirements 46
10.2.1 General 46
10.2.2 Modification request 47
10.2.3 Impact analysis 47
10.2.4 Authorization 47
10.2.5 Documentation 47
Annex A (informative) Sequential task table 48
Annex B (informative) Example for estimation of *PFH* 52

B.1 General 52
B.2 Example *PDS(SR)* structure 52
B.2.1 General 52
B.2.2 *Subsystem* A/B 53
B.2.3 *Subsystem* PS/VM 53
B.3 Example PDS(SR) PFH value determination 54
B.3.1 *Subsystem* “A/B” (main *subsystem*) 54
B.3.2 *Subsystem* “PS/VM” 59
B.3.3 *PFH* value of the *safety sub-function* STO of *PDS(SR)* 62
B.4 Reduction of DC and SFF depending on test interval 63
Annex C (informative) Available failure rate databases 64
C.1 Databases 64
C.2 Helpful standards concerning component failure 64
Annex D (informative) Fault lists and fault exclusions 66
D.1 General 66
D.2 Remarks applicable to fault exclusions 66
D.2.1 Validity of exclusions 66
D.2.2 Tin whisker growth 66
D.2.3 Short-circuits on PWB-mounted parts 66
D.3 Fault models 67
D.3.1 Conductors/cables 67
D.3.2 Printed wiring boards/assemblies 67
D.3.3 Terminal block 67
D.3.4 Multi-pin connector 68
D.3.5 Electromechanical devices 68
D.3.6 Transformers 69
D.3.7 Inductances 69
D.3.8 Resistors 69
D.3.9 Resistor Networks 69
D.3.10 Potentiometers 69
D.3.11 Capacitors 69
D.3.12 Discrete semiconductors 69
D.3.13 Signal Isolation components 70
D.3.14 Non-programmable integrated circuits 70
D.3.15 Programmable and/or complex integrated circuits 70
D.3.16 Motion and position feedback sensors 71
Annex E (normative) Electromagnetic (EM) immunity requirement for *PDS(SR)* 75
E.1 General 75
E.2 Immunity requirements – low frequency disturbances 75
E.3 Immunity requirements – high frequency disturbances 78
Annex F (informative) Estimation of PFD_{avg} value for low demand with given PFH value 82
F.1 General 82
F.2 Estimation of PFD_{avg} value for low demand with given PFH value 82
Bibliography 83

Figure 1 – Installation and functional parts of a *PDS(SR)* 10
Figure 2 – *Safety function* consisting of *safety sub-functions* 20

Figure 3 – *PDS(SR)* development lifecycle 24
Figure B.1 – Example *PDS(SR)* 52
Figure B.2 – *Subsystem*s of the *PDS(SR)* 53
Figure B.3 – Function blocks of *subsystem* A/B 54
Figure B.4 – Reliability model (Markov) of *subsystem* A/B 57
Figure B.5 – Function blocks of *subsystem* PS/VM 59
Figure B.6 – Reliability model (Markov) of *subsystem* PS/VM 61

Table 1 – Alphabetical list of terms and definitions 12
Table 2 – Example for determining the *SIL* from hardware and software independence 31
Table 3 – *Safety integrity levels*: target failure measures for a *PDS(SR) safety sub-function* 32
Table 4 – Maximum allowable safety integrity level for a *safety sub-function* carried out by a type A safety-related *subsystem* 35
Table 5 – Maximum allowable safety integrity level for a *safety sub-function* carried out by a type B safety-related *subsystem* 36
Table A.1 – Design and development procedure for *PDS(SR)* 48
Table B.1 – Determination of DC factor of subsystem A/B 56
Table B.2 – *PFH* value calculation results for *subsystem* A/B 59
Table B.3 – Determination of DC factor of *subsystem* A/B 60
Table B.4 – *PFH* value calculation results for *subsystem* PS/VM 62
Table D.1 – Printed wiring boards/assemblies 67
Table D.2 – Terminal block 68
Table D.3 – Multi-pin connector 68
Table D.4 – Electromechanical devices (for example relay, contactor relays) 69
Table D.5 – Signal Isolation components 70
Table D.6 – Non-programmable integrated circuits 70
Table D.7 – Programmable and/or complex integrated circuits 71
Table D.8 – Motion and position feedback sensors without determined *SIL* and/or PL 72
Table E.1 – Minimum immunity requirements for voltage deviations, dips and short interruptions 76
Table E.2 – *PDS(SR)* minimum immunity requirements for voltage deviations, dips and short interruptions on main power ports with a rated voltage above 1 000 V 77
Table E.3 – Immunity requirements – high frequency disturbances 78
Table E.4 – General frequency ranges for mobile transmitters and ISM for radiated tests 80
Table E.5 – General frequency ranges for mobile transmitters and ISM for conducted tests 81

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This consolidated version of the official IEC Standard and its amendment has been prepared for user convenience.

IEC 61800-5-2 edition 2.1 contains the second edition (2016-04) [documents 22G/332/FDIS and 22G/335/RVD] and its amendment 1 (2026-10) [documents 22G/532/CDV and 22G/535/RVC].

In this Redline version, a vertical line in the margin shows where the technical content is modified by amendment 1. Additions are in green text, deletions are in strikethrough red text. A separate Final version with all changes accepted is available in this publication.

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:

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 document and its amendment will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,

– withdrawn, or

– revised.

INTRODUCTION

As a result of automation, demand for increased production and reduced operator physical effort, control systems of machinery and plant items play an increasing role in the achievement of overall safety. These control systems increasingly employ complex electrical/ electronic/programmable electronic devices and systems.

Prominent amongst these devices and systems are adjustable speed electrical power drive systems (PDS) that are suitable for use in safety-related applications (*PDS(SR)*).

Examples of industrial applications are:

- machine tools, robots, production test equipment, test benches;
- papermaking machines, textile production machines, calendars in the rubber industry;
- process lines in plastics, chemicals or metal production, rolling-mills;
- cement crushing machines, cement kilns, mixers, centrifuges, extrusion machines;
- drilling machines;
- conveyors, materials handling machines, hoisting equipment (cranes, gantries, etc.);
- pumps, fans, etc.

This standard can also be used as a reference for developers using *PDS(SR)* for other applications.

Users of this standard should be aware that some type C standards for machinery currently refer to ISO 13849-1 for safety-related control systems. In this case, *PDS(SR)* manufacturers may be requested to provide further information (e.g. category and performance level PL) to facilitate the integration of a *PDS(SR)* into the safety-related control systems of such machinery.

NOTE ”Type C standards” are defined in ISO 12100 as machine safety standards dealing with detailed safety requirements for a particular machine or group of machines.

There are many situations where control systems that incorporate a *PDS(SR)* are employed, for example as part of safety measures that have been provided to achieve risk reduction. A typical case is guard interlocking in order to exclude personnel from *hazard*s where access to the dangerous area is only possible when rotating parts have stopped. This part of IEC 61800 gives a methodology to identify the contribution made by a *PDS(SR)* to identified *safety sub-function*s and to enable the appropriate design of the *PDS(SR)* and verification that it meets the required performance.

Measures are given to co-ordinate the safety performance of the *PDS(SR)* with the intended risk reduction taking into account the probabilities and consequences of its random and systematic faults.

1 Scope

This part of IEC 61800, which is a product standard, specifies requirements and makes recommendations for the design and development, integration and validation of safety related power drive systems (*PDS(SR))* in terms of their functional safety considerations. It applies to adjustable speed electrical power drive systems covered by the other parts of the IEC 61800 series of standards as referred in IEC 61800-2.

NOTE 1 The term “integration” refers to the *PDS(SR)* itself, not to its incorporation into the safety-related application.

NOTE 2 Other parts of IEC 61800 cover rating specifications, EMC, electrical safety, etc.

This International Standard is applicable where functional safety of a *PDS(SR)* is claimed and the *PDS(SR)* is operating mainly in the high demand or continuous mode (see 3.15)

While low demand mode operation is possible for a *PDS(SR)*, this standard concentrates on high demand and continuous mode. *Safety sub-function*s implemented for high demand or continuous mode can also be used in low demand mode. Requirements for low demand mode are given in IEC 61508 series. Some guidance for the estimation of average probability of dangerous failure on demand (PFD_{avg}) value is provided in Annex F.

This part of IEC 61800 sets out safety-related considerations of *PDS(SR)*s in terms of the framework of IEC 61508, and introduces requirements for *PDS(SR)*s as *subsystem*s of a safety-related system. It is intended to facilitate the realisation of the electrical/ electronic/ programmable electronic (E/E/PE) parts of a *PDS(SR)* in relation to the safety performance of *safety sub-function*(s) of a PDS.

Manufacturers and suppliers of *PDS(SR)*s by using the normative requirements of this part of IEC 61800 will indicate to users (system integrator, original equipment manufacturer) the safety performance for their equipment. This will facilitate the incorporation of a *PDS(SR)* into a safety-related control system using the principles of IEC 61508, and possibly its specific sector implementations (for example IEC 61511, IEC 61513, IEC 62061 or ISO 13849).

By applying the requirements from this part of the IEC 61800 series, the corresponding requirements of IEC 61508 that are necessary for a *PDS(SR)* are fulfilled.

This part of IEC 61800 does not specify requirements for:

- the *hazard* and risk analysis of a particular application;
- the identification of *safety sub-function*s for that application;
- the initial allocation of *SIL*s to those *safety sub-function*s;
- the driven equipment except for interface arrangements;
- secondary *hazard*s (for example from failure in a production or manufacturing process);
- the electrical, thermal and energy safety considerations, which are covered in +IEC 61800-5-1;
- the *PDS(SR)* manufacturing process;
- the validity of signals and commands to the *PDS(SR)*.
- ~~security aspects (e.g. cyber security or *PDS(SR)* security of access)~~

NOTE 3 The functional safety requirements of a *PDS(SR)* are dependent on the application, and can be considered as a part of the overall risk assessment of the *installation*. Where the supplier of the *PDS(SR)* is not responsible for the driven equipment, the *installation* designer is responsible for the risk assessment, and for specifying the functional and safety integrity requirements of the *PDS(SR)*.

This part of IEC 61800 only applies to *PDS(SR)*s implementing *safety sub-function*s with a *SIL* not greater than *SIL* 3.

Figure 1 shows the installation and the functional parts of a *PDS(SR)* that are considered in this part of IEC 61800 and shows a logical representation of a *PDS(SR)* rather than its physical description.

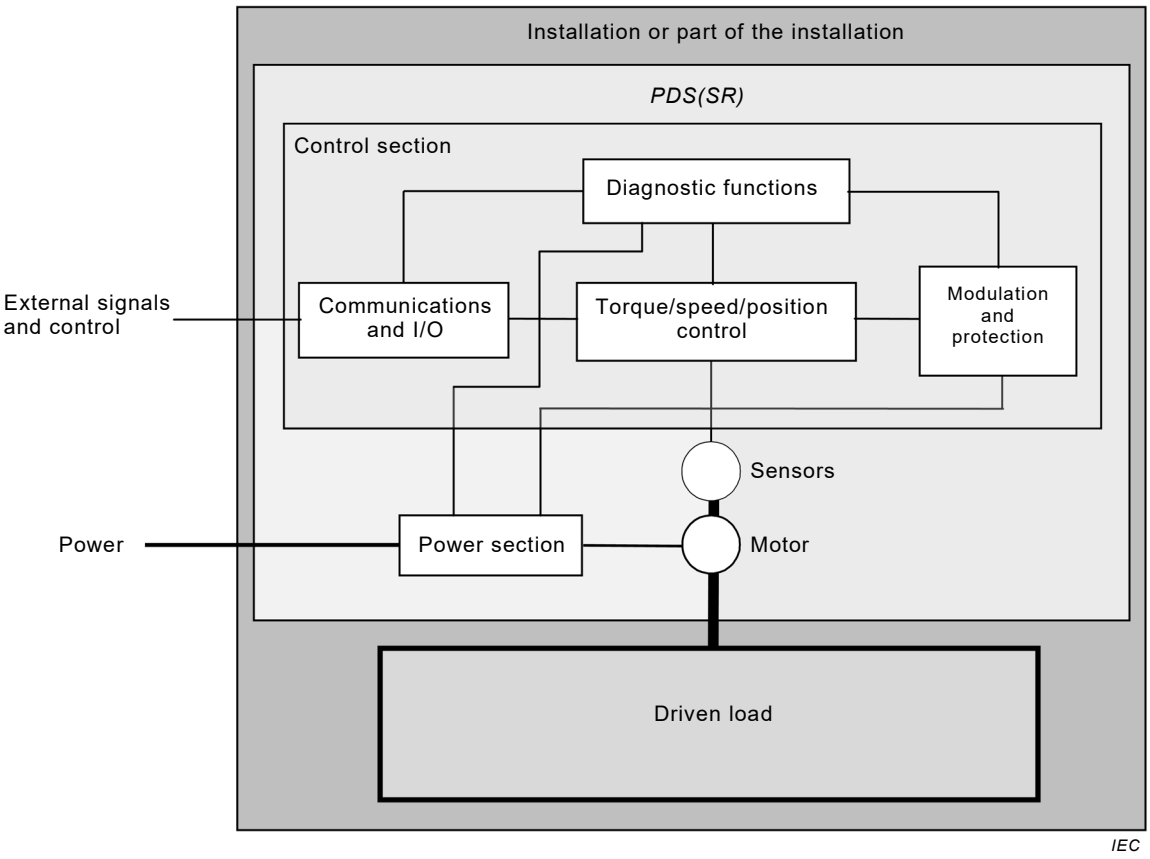


Figure 1 – Installation and functional parts of a *PDS(SR)*

2 Normative references

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.

IEC 60204-1:2016, *Safety of machinery - Electrical equipment of machines - Part 1: General requirements*
IEC 60204-1:2016/AMD1:2021

IEC 61000-2-4:2002, *Electromagnetic compatibility (EMC) – Part 2-4: Environment – Compatibility levels in industrial plants for low-frequency conducted disturbances*

IEC 61000-4-2:2008, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*

IEC 61000-4-3:~~2006~~2020, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*
~~IEC 61000-4-3:2006/AMD1:2007~~
~~IEC 61000-4-3:2006/AMD2:2010~~

IEC 61000-4-4:2012, *Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test*

IEC 61000-4-5:2014, *Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test*

IEC 61000-4-6:~~2013~~2023, *Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields*

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*

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*
IEC 61000-4-34:2005/AMD1:2009

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*

~~IEC 61400-21:2008, *Wind turbines – Part 21: Measurement and assessment of power quality characteristics of grid connected wind turbines*~~

IEC 61400-21-1:2019, *Wind energy generation systems - Part 21-1: Measurement and assessment of electrical characteristics - Wind turbines*

IEC 61508-1:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 1: General requirements*

IEC 61508-2:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 2: Requirements for electrical/electronic/programmable electronic safety-related systems*

IEC 61508-3:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 3: Software requirements*

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*

IEC 61508-7:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems – Part 7: Overview of techniques and measures*

IEC 61800-1:2021, *Adjustable speed electrical power drive systems – Part 1: General requirements – Rating specifications for low voltage adjustable speed ~~d.c.~~ DC power drive systems*

IEC 61800-2:~~2015~~2021, *Adjustable speed electrical power drive systems – Part 2: General requirements – Rating specifications for ~~low voltage~~ adjustable speed ~~a.c.~~ AC power drive systems*

IEC 61800-3:~~2004~~2022, *Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods for PDS and machine tools*
~~IEC 61800-3:2004/AMD1:2011~~

~~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*~~

IEC 61800-5-1:~~2007~~2022, *Adjustable speed electrical power drive systems – Part 5-1: Safety requirements – Electrical, thermal and energy*

IEC TS 63074:2023, *Safety of machinery - Security aspects related to functional safety of safety-related control systems*

ISO 13849-1:~~2006~~2023, *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*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. Table 1 shows an alphabetical list of terms and definitions

Table 1 – Alphabetical list of terms and definitions

3.1	basic drive module BDM	3.12	hazard	3.23	safety sub-function(s) (of a PDS(SR))
3.2	category	3.13	installation	3.24	safety integrity
3.3	complete drive module CDM	3.14	mission time TM	3.25	safety integrity level SIL
3.4	common cause failure	3.15	mode of operation	3.26	safety-related system
3.5	dangerous failure	3.16	PDS(SR)	3.27	safety requirements specification SRS
3.6	diagnostic coverage DC	3.17	average frequency of a dangerous failure PFH	3.28	SIL capability
3.7	diagnostic test(s)	3.18	Performance Level PL	3.29	subsystem
3.8	fail safe	3.19	safe failure	3.30	systematic failure
3.9	fail safe state FS	3.20	safe failure fraction SFF	3.31	systematic safety integrity
3.10	fault reaction function	3.21	safe state	3.32	validation
3.11	functional safety	3.22	safety function	3.33	verification
				3.34	security risk

NOTE Throughout this International Standard, references to the following definitions are identified by writing them in *italic* script.