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Time relays and coupling relays for industrial and residential use - Part 1: Requirements and tests

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/25

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EUROPÄISCHE NORM

EN IEC 61812-1

November 2024

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Supersedes EN 61812-1:2011

English Version

**Time relays and coupling relays for industrial and residential use
- Part 1: Requirements and tests
(IEC 61812-1:2023)**

Relais temporisés et relais de de couplage pour
applications industrielles et résidentielles - Partie 1:
Exigences et essais
(IEC 61812-1:2023)

Zeitrelais und Koppelrelais für industrielle Anwendungen
und in der Gebäudeinstallation Teil 1: Anforderungen und
Prüfungen
(IEC 61812-1:2023)

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

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

EN IEC 61812-1:2024 (E)**European foreword**

The text of document 94/843/FDIS, future edition 3 of IEC 61812-1, prepared by TC 94 "Electrical relays" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61812-1:2024.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2025-11-30 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2027-11-30 document have to be withdrawn

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

IEC 60060-1:2010	NOTE	Approved as EN 60060-1:2010 (not modified)
IEC 60068-2-78:2001	NOTE	Approved as EN 60068-2-78:2001 (not modified)
IEC 60715:2017	NOTE	Approved as EN 60715:2017 (not modified)
IEC 60947-1:2020	NOTE	Approved as EN IEC 60947-1:2021 (not modified)
IEC 61180:2016	NOTE	Approved as EN 61180:2016 (not modified)
IEC 61508 series	NOTE	Approved as EN 61508 series
IEC 61810 series	NOTE	Approved as EN 61810 series
IEC 62430	NOTE	Approved as EN IEC 62430
IEC 62443-4-2	NOTE	Approved as EN IEC 62443-4-2
IEC 62474	NOTE	Approved as EN IEC 62474
IEC/TR 63201	NOTE	Approved as CLC IEC/TR 63201
ISO 14121-1	NOTE	Approved as EN ISO 14121-1
ISO 14971	NOTE	Approved as EN ISO 14971

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where 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.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-444	2002	International Electrotechnical Vocabulary - Part 444: Elementary relays	-	-
IEC 60050-445	2010	International Electrotechnical Vocabulary - Part 445: Time relays	-	-
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 60085	2007	Electrical insulation - Thermal evaluation and designation	EN 60085	2008
IEC 60112	2020	Method for the determination of the proof and the comparative tracking indices of solid insulating materials	EN IEC 60112	2020
IEC 60529	1989	Degrees of protection provided by enclosures (IP Code)	EN 60529	1991
-	-		+ corrigendum May	1993
+ A1	1999		+ A1	2000
+ A2	2013		+ A2	2013
IEC 60664-1	2020	Insulation coordination for equipment within low-voltage supply systems - Part 1: Principles, requirements and tests	EN IEC 60664-1	2020
IEC 60664-3	2016	Insulation coordination for equipment within low-voltage systems - Part 3: Use of coating, potting or moulding for protection against pollution	EN 60664-3	2017

EN IEC 61812-1:2024 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60664-4	2005	Insulation coordination for equipment within low-voltage systems - Part 4: Consideration of high-frequency voltage stress	EN 60664-4	2006
-	-		+ corrigendum Oct.	2006
IEC 60695-2-11	2021	Fire hazard testing - Part 2-11: Glowing/hot-wire based test methods - Glow-wire flammability test method for end products (GWEPT)	EN IEC 60695-2-11	2021
IEC 60695-10-2	2014	Fire hazard testing - Part 10-2: Abnormal heat - Ball pressure test method	EN 60695-10-2	2014
IEC 60947-5-1	2016	Low-voltage switchgear and controlgear - Part 5-1: Control circuit devices and switching elements - Electromechanical control circuit devices	EN 60947-5-1	2017
IEC 60947-5-4	2002	Low-voltage switchgear and controlgear - Part 5-4: Control circuit devices and switching elements - Method of assessing the performance of low-energy contacts - Special tests	EN 60947-5-4	2003
+ A1	2019		+ A1	2019
IEC 60999-1	1999	Connecting devices - Electrical copper conductors - Safety requirements for screw-type and screwless-type clamping units - Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm ² up to 35 mm ² (included)	EN 60999-1	2000
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	2020	Electromagnetic compatibility (EMC) - Part 4-3 : Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN IEC 61000-4-3	2020
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
+ A1	2017		+ A1	2017
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 61000-4-8	2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	2010

EN IEC 61812-1:2024 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-4-11	2020	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase	EN IEC 61000-4-11	2020
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
+ A1	2009		+ A1	2009
IEC 61210 (mod)	2010	Connecting devices - Flat quick-connect terminations for electrical copper conductors - Safety requirements	EN 61210	2010
IEC 61810-1	2015	Electromechanical elementary relays - Part 1: General and safety requirements	EN 61810-1	2015
+ A1	2019		+ A1	2020
IEC 61984	2008	Connectors - Safety requirements and tests	EN 61984	2009
IEC 62314	2022	Solid-state relays - Safety requirements	EN IEC 62314	2024
CISPR 11 (mod)	2015	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement	EN 55011	2016
+ A1	2016		+ A1	2017
-	-		+ A11	2020
+ A2	2019		+ A2	2021
ISO 9223	2012	Corrosion of metals and alloys - Corrosivity of atmospheres - Classification, determination and estimation	EN ISO 9223	2012



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Time relays and coupling relays for industrial and residential use –
Part 1: Requirements and tests**

**Relais temporisés et relais de couplage pour applications industrielles et
résidentielles –
Partie 1: Exigences et essais**





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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Time relays and coupling relays for industrial and residential use –
Part 1: Requirements and tests**

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CONTENTS

FOREWORD.....	6
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	10
3.1 Terms and definitions related to general terms.....	10
3.2 Terms and definitions of time relay types	15
4 Classification.....	22
4.1 Switching element.....	22
4.2 Mechanical construction.....	22
4.3 Device mounting	22
4.4 Connection	22
4.5 Environment	22
5 Influence quantities	22
6 Rated values	23
6.1 General.....	23
6.2 Input voltage and frequency	23
6.3 Release voltage	24
6.4 Power consumption.....	24
6.5 Output circuit	24
6.5.1 General	24
6.5.2 Electromechanical output circuit	24
6.5.3 Solid state output circuit	25
6.5.4 Endurance and operating frequency	25
6.5.5 Conditional short-circuit current	26
6.6 Ambient temperature.....	26
6.7 Transport and storage temperature	26
6.8 Humidity	26
6.9 Pollution degree.....	26
6.10 Altitude	26
6.11 Timing circuit function	26
6.11.1 General	26
6.11.2 Setting accuracy	27
6.11.3 Repeatability	27
6.11.4 Recovery time and minimum control impulse	27
7 Provisions for testing	27
7.1 General.....	27
7.2 Type test.....	27
7.3 Routine test	28
7.4 Sampling test.....	29
8 Documentation and marking	29
8.1 Data.....	29
8.2 Marking.....	32
9 Heating.....	32
9.1 General.....	32
9.2 Test conditions	33
9.3 Heating of terminals.....	33

9.3.1	General	33
9.3.2	Heating of screw terminals and screwless terminals	33
9.3.3	Heating of quick-connect terminations	34
9.3.4	Heating of sockets	34
9.3.5	Heating of alternative termination types	35
9.4	Heating of accessible parts	35
9.5	Ball pressure test	35
10	Basic operating function	36
10.1	General	36
10.2	Operate	36
10.3	Release	36
10.4	Time function	36
10.4.1	General	36
10.4.2	Functional test at reference values of input quantities	36
10.4.3	Effect of influence of voltage and temperature	37
11	Dielectric strength and impulse withstand	37
11.1	General	37
11.2	Preconditioning	37
11.3	Insulation test	38
11.3.1	General	38
11.3.2	Impulse withstand test	38
11.3.3	Dielectric AC power frequency voltage test	39
12	Electrical endurance	40
12.1	General	40
12.2	Resistive loads, inductive loads, and special loads	40
12.3	Low energy loads	40
13	Conditional short-circuit current of an output circuit	41
13.1	General	41
13.2	Test procedure	41
13.3	Test circuit electromechanical output circuit	41
13.4	Test circuit solid state output circuit	42
13.5	Condition of switching element after test	42
14	Insulation coordination and protection against electric shock	43
14.1	General	43
14.2	Clearances and creepage distances	43
14.2.1	General	43
14.2.2	Clearances	44
14.2.3	Creepage distances	44
14.3	Solid insulation	45
14.4	Protection against direct contact	46
15	Mechanical strength	46
15.1	General	46
15.2	Mechanical strength of terminals and current-carrying parts	46
15.2.1	General	46
15.2.2	Mechanical strength of screw terminals and screwless terminals	46
15.2.3	Mechanical strength of flat quick-connect terminations	46
15.2.4	Mechanical strength of sockets	47
15.2.5	Mechanical strength of alternative termination types	47

16	Heat and fire resistance.....	47
16.1	General.....	47
16.2	Glow-wire test.....	47
17	Vibration and shock.....	48
17.1	Vibration.....	48
17.2	Shock.....	48
18	Electromagnetic compatibility (EMC).....	49
18.1	General.....	49
18.2	Immunity.....	49
18.3	Radiated and conducted emission.....	49
19	Cybersecurity for industrial automation and control systems (IACS).....	50
20	Environmental information.....	50
20.1	Environmentally conscious design process.....	50
20.2	Procedure to establish material declaration.....	50
Annex A (informative) Setting accuracy, repeatability and effect of influence calculation.....		51
A.1	General.....	51
A.2	Example of calculation.....	51
Annex B (informative) Risk assessment.....		52
B.1	General.....	52
B.2	Risk assessment procedure.....	52
B.3	Achieving tolerable risk.....	53
B.4	Application of risk assessment procedures (proposal for the user).....	57
Annex C (normative) Tests for EMC.....		58
C.1	General.....	58
C.2	EMC immunity.....	58
C.2.1	General.....	58
C.2.2	Performance criteria.....	58
C.3	EMC radiated and conducted emission.....	62
C.3.1	General.....	62
C.3.2	Conducted radio-frequency emission tests.....	62
C.3.3	Radiated radio-frequency emission tests.....	62
Bibliography.....		63
Figure 1 – Definition of ports.....		13
Figure 2 – Power ON-delay relay.....		15
Figure 3 – Power OFF-delay relay.....		15
Figure 4 – OFF-delay relay with control signal.....		16
Figure 5 – ON- and OFF-delay relay with control signal.....		16
Figure 6 – Flasher relay.....		17
Figure 7 – Star-delta relay.....		18
Figure 8 – Summation time relay.....		18
Figure 9 – Pulse delayed relay.....		19
Figure 10 – Pulse delayed relay with control signal.....		19
Figure 11 – Interval relay.....		20
Figure 12 – Interval relay with control signal.....		20

Figure 13 – Retriggerable interval relay with control signal ON	21
Figure 14 – Retriggerable interval relay with control signal OFF	21
Figure 15 – Maintained time relay	22
Figure 16 – Test circuit electromechanical output, conditional short-circuit current	42
Figure 17 – Test circuit solid state output, conditional short-circuit current.....	42
Figure B.1 – Iterative process of risk assessment and risk reduction.....	53
Figure B.2 – Risk reduction.....	55
Figure B.3 – Example of the time relay circuit block diagram.....	56
Table 1 – Influence quantities and reference values.....	23
Table 2 – Preferred values of endurance	25
Table 3 – Preferred values of maximum permissible operating frequency.....	25
Table 4 – Recommended final values of the setting range.....	27
Table 5 – Type testing	28
Table 6 – Routine testing	29
Table 7 – Required time relay or coupling relay information	29
Table 8 – Thermal classification.....	32
Table 9 – Cross-sectional areas and lengths of conductors dependent on the current carried by the terminal	34
Table 10 – Maximum steady state current dependent on the connector size	34
Table 11 – Temperature rise limits of accessible parts	35
Table 12 – Changing of influencing quantities	37
Table 13 – Impulse test for basic insulation	39
Table 14 – Dielectric test voltage for basic insulation for devices suitable for use in single-phase three- or two-wire AC and DC systems.....	39
Table 15 – Dielectric test voltage for basic insulation for devices suitable for use in three-phase four or three-wire AC systems	40
Table 16 – Minimum clearances for basic insulation.....	44
Table 17 – Minimum clearances in controlled overvoltage conditions	44
Table 18 – Minimum creepage distances for basic insulation	45
Table A.1 – Calculation formulae	51
Table B.1 – Examples of the relation between failure mode, consequences and hazard.....	56
Table B.2 – Severity of harm.....	57
Table B.3 – Probability of harm.....	57
Table B.4 – Risk category	57
Table C.1 – Environmental conditions influencing EMC.....	58
Table C.2 – Immunity tests for industrial environments	60
Table C.3 – Immunity tests for residential, commercial and light-industrial environments	61
Table C.4 – Terminal disturbance voltage limits for conducted radio-frequency emission (for power port)	62
Table C.5 – Radiated emission test limits.....	62

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TIME RELAYS AND COUPLING RELAYS FOR INDUSTRIAL AND RESIDENTIAL USE –

Part 1: Requirements and tests

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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IEC 61812-1 has been prepared by IEC technical committee 94: Electrical relays. It is an International Standard.

This third edition cancels and replaces the second edition published in 2011. This edition constitutes a technical revision.

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

- a) update of references;
- b) addition of requirements for risk assessment;
- c) addition of requirements for routine test;
- d) renumbering of clauses to bring them into a more logical order;
- e) clarification of the requirement for shock;
- f) addition of cybersecurity requirements for industrial automation and control systems;

- g) addition of environmentally conscious design requirement;
- h) addition of common data dictionary reference;
- i) addition of terms and definitions of relay types;
- j) addition of coupling relays in title;
- k) addition of coupling relays in scope.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
94/843/FDIS	94/889/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

A list of all parts of the IEC 61812 series can be found, under the general title *Time relays and coupling relays for industrial and residential use*, on the IEC website.

Future documents in this series will carry the new general title as cited above. Titles of existing documents in this series will be updated at the time of the next edition.

The committee has decided that the contents of this document 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,
- replaced by a revised edition, or
- amended.

IMPORTANT – The "colour inside" logo on the cover page of this document 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.

TIME RELAYS AND COUPLING RELAYS FOR INDUSTRIAL AND RESIDENTIAL USE –

Part 1: Requirements and tests

1 Scope

This part of IEC 61812 applies to time relays and coupling relays for industrial applications (for example control, automation, signal and industrial equipment) and for automatic electrical controls for use in, on, or in association with equipment for residential and similar use.

The term “relay” as used in this document comprises all types of time relays and coupling relays, other than measuring relays.

NOTE 1 Time relays and coupling relays can be used for industrial application (for example control, automation, signal and industrial equipment) and for automatic electrical controls for use in, on, or in association with equipment for residential and similar use.”

NOTE 2 Measuring relays are handled by the IEC TC95.

This document defines type test and routine test to confirm the service condition. Subclause 3.2 provides definitions for different types of time relays in use in the IEC 61812 series.

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.

IEC 60050-444:2002, *International Electrotechnical Vocabulary (IEV) – Part 444: Elementary relays*

IEC 60050-445:2010, *International Electrotechnical Vocabulary (IEV) – Part 445: Time relays*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test B: Dry heat*

IEC 60068-2-6:2007, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60085:2007, *Electrical insulation – Thermal evaluation and designation*

IEC 60112:2020, *Method for the determination of the proof and the comparative tracking indices of solid insulating materials*

IEC 60529:1989, *Degrees of protection provided by enclosures (IP Code)*
IEC 60529:1989/AMD1:1999
IEC 60529:1989/AMD2:2013

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60664-3:2016, *Insulation coordination for equipment within low-voltage systems – Part 3: Use of coating, potting or moulding for protection against pollution*

IEC 60664-4:2005, *Insulation coordination for equipment within low-voltage systems – Part 4: Consideration of high-frequency voltage stress*

IEC 60695-2-11:2021, *Fire hazard testing – Part 2-11: Glowing/hot-wire based test methods – Glow-wire flammability test method for end products (GWEPT)*

IEC 60695-10-2:2014, *Fire hazard testing – Part 10-2: Abnormal heat – Ball pressure test method*

IEC 60947-5-1:2016, *Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices*

IEC 60947-5-4:2002, *Low-voltage switchgear and controlgear – Part 5-4: Control circuit devices and switching elements – Method of assessing the performance of low-energy contacts – Special tests*

IEC 60947-5-4:2002/AMD1:2019

IEC 60999-1:1999, *Connecting devices – Electrical copper conductors – Safety requirements for screw-type and screwless-type clamping units – Part 1: General requirements and particular requirements for clamping units for conductors from 0,2 mm² up to 35 mm² (included)*

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

IEC 61000-4-3:2020, *Electromagnetic compatibility (EMC) – Part 4-3: Testing and measurement techniques – Radiated, radio-frequency, electromagnetic field immunity test*

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 61000-4-5:2014/AMD1:2017

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

IEC 61000-4-8:2009, *Electromagnetic compatibility (EMC) – Part 4-8: Testing and measurement techniques – Power frequency magnetic field immunity test*

IEC 61000-4-11:2020, *Electromagnetic compatibility (EMC) – Part 4-11: Testing and measurement techniques – Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current up to 16 A per phase*

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 mains current more than 16 A per phase*

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

IEC 61210:2010, *Connecting devices – Flat quick-connect terminations for electrical copper conductors – Safety requirements*

IEC 61810-1:2015, *Electromechanical elementary relays – Part 1: General and safety requirements*

IEC 61810-1:2015/AMD1:2019

IEC 61984:2008, *Connectors – Safety requirements and tests*

IEC 62314:2022, *Solid-state relays – Safety requirements*

CISPR 11:2015, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

CISPR 11:2015/AMD1:2016

CISPR 11:2015/AMD2:2019

ISO 9223:2012, *Corrosion of metals and alloys – Corrosivity of atmospheres – Classification, determination and estimation*

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