
Nizkonapetostne stikalne in krmilne naprave - Ocena elektromagnetne združljivosti za stikalne in krmilne naprave ter njihove sklope (IEC/TR 63216:2019)

Low-voltage switchgear and controlgear - Electromagnetic compatibility assessment for switchgear and controlgear and their assemblies (IEC/TR 63216:2019)

Niederspannungsschaltgeräte - Bewertung der elektromagnetischen Verträglichkeit von Schaltgeräten und deren Schaltgerätekombinationen (IEC/TR 63216:2019)

Appareillage à basse tension – Evaluation de la compatibilité électromagnétique des appareillages et ensembles d'appareillages à basse tension (IEC/TR 63216:2019)

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44-b979957/sist-tp-clc-iec-tr-63216-2020>

Ta slovenski standard je istoveten z: CLC/IEC TR 63216:2020

ICS:

29.130.20	Nizkonapetostne stikalne in krmilne naprave	Low voltage switchgear and controlgear
33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

SIST-TP CLC IEC/TR 63216:2020 **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST-TP CLC IEC/TR 63216:2020](https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020)

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>

TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CLC/IEC TR 63216

August 2020

ICS 29.130.20

English Version

Low-voltage switchgear and controlgear - Electromagnetic
compatibility assessment for switchgear and controlgear and
their assemblies
(IEC/TR 63216:2019)

Appareillage à basse tension - Evaluation de la
compatibilité électromagnétique des appareillages et
ensembles d'appareillages à basse tension
(IEC/TR 63216:2019)

Niederspannungsschaltgeräte - Bewertung der
elektromagnetischen Verträglichkeit von Schaltgeräten und
deren Schaltgerätekombinationen
(IEC/TR 63216:2019)

This Technical Report was approved by CENELEC on 2020-08-10.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

[SIST-TP CLC IEC/TR 63216:2020](https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020)

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>



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

CLC/IEC TR 63216:2020 (E)**European foreword**

This document (CLC/IEC TR 63216:2020) consists of the text of IEC/TR 63216:2019 prepared by SC 121A "Low-voltage switchgear and controlgear" of IEC/TC 121 "Switchgear and controlgear and their assemblies for low voltage".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Technical Report IEC/TR 63216:2019 was approved by CENELEC as a European Technical Report without any modification.

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

IEC 60038	NOTE	Harmonized as EN 60038
IEC 60364-5-52	NOTE	Harmonized as HD 60364-5-52
IEC 60947 (series)	NOTE	Harmonized as EN IEC 60947 (series)
IEC 61000 (series)	NOTE	Harmonized as EN 61000 (series)
IEC 61000-2-2	NOTE	Harmonized as EN 61000-2-2
IEC 61000-2-12	NOTE	Harmonized as EN 61000-2-12
IEC 61000-4-9	NOTE	Harmonized as EN 61000-4-9
IEC 61000-4-10	NOTE	Harmonized as EN 61000-4-10
IEC 61000-4-12	NOTE	Harmonized as EN 61000-4-12
IEC 61000-4-14	NOTE	Harmonized as EN 61000-4-14
IEC 61000-4-20	NOTE	Harmonized as EN 61000-4-20
IEC 61000-4-21	NOTE	Harmonized as EN 61000-4-21
IEC 61000-4-27	NOTE	Harmonized as EN 61000-4-27
IEC 61000-4-28	NOTE	Harmonized as EN 61000-4-28
IEC 61000-4-31	NOTE	Harmonized as EN 61000-4-31
IEC 61000-4-34	NOTE	Harmonized as EN 61000-4-34
IEC 61000-4-39	NOTE	Harmonized as EN 61000-4-39
IEC 61000-6-4	NOTE	Harmonized as EN IEC 61000-6-4
IEC 61439 (series)	NOTE	Harmonized as EN IEC 61439 (series)
IEC 61508 (series)	NOTE	Harmonized as EN 61508 (series)

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.cenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60050-161	1990	International Electrotechnical Vocabulary. - Chapter 161: Electromagnetic compatibility	-	-
+ A1	1997		-	-
+ A2	1998		-	-
+ A3	2014		-	-
+ A4	2014		-	-
+ A5	2015		-	-
+ A6	1990		-	-
+ A7	2017		-	-
+ A8	2018		-	-
IEC 60050-441	-	International Electrotechnical Vocabulary. - Switchgear, controlgear and fuses	-	-
IEC 60364-4-44	-	Electrical installations of buildings -- Part 4- 44: Protection for safety - Protection against voltage disturbances and electromagnetic disturbances	-	-
IEC 60364-5-53	-	Low-voltage electrical installations -- Part - 5-53: Selection and erection of electrical equipment - Protection, isolation, switching, control and monitoring	-	-
IEC 60364-5-54	-	Low-voltage electrical installations - Part 5- 54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors	HD 60364-5-54	-
IEC 60947-1	-	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	-
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

CLC/IEC TR 63216:2020 (E)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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	-	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	EN 61000-4-3	-
IEC 61000-4-4	-	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test	EN 61000-4-4	-
IEC 61000-4-5	-	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	EN 61000-4-5	-
IEC 61000-4-6	-	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields	EN 61000-4-6	-
IEC 61000-4-8	-	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test	EN 61000-4-8	-
IEC 61000-4-11	-	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	-
IEC 61000-4-13	-	Electromagnetic compatibility (EMC) - Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests	EN 61000-4-13	-
IEC 61000-4-16	-	Electromagnetic compatibility (EMC) - Part 4-16: Testing and measurement techniques - Test for immunity to conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz	EN 61000-4-16	-
IEC 61000-4-18	-	Electromagnetic compatibility (EMC) - Part 4-18: Testing and measurement techniques - Damped oscillatory wave immunity test	EN IEC 61000-4-18	-
IEC 61000-4-19	-	Electromagnetic compatibility (EMC) - Part 4-19: Testing and measurement techniques - Test for immunity to conducted, differential mode disturbances and signalling in the frequency range 2 kHz to 150 kHz at a.c. power ports	EN 61000-4-19	-
IEC 61000-6-1	-	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments	EN IEC 61000-6-1	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN IEC 61000-6-2	-
IEC 61000-6-3	-	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments	EN 61000-6-3	-
IEC 61000-6-5	-	Electromagnetic compatibility (EMC) - Part 6-5: Generic standards - Immunity for equipment used in power station and substation environment	EN 61000-6-5	-
IEC 61000-6-7	-	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	-
IEC 61131-2	-	Industrial-process measurement and control – Programmable controllers – Part 2: Equipment requirements and tests	EN 61131-2	-
IEC 61439-1	2011	Low-voltage switchgear and controlgear assemblies - Part 1: General rules	EN 61439-1	2011
IEC 61800-3	-	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods	EN IEC 61800-3	-
IEC Guide 107	-	Electromagnetic compatibility - Guide to the drafting of electromagnetic compatibility publications	-	-
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
+ A2	2019		-	-
-	-		+ A11	2020
CISPR 32	-	Electromagnetic compatibility of multimedia equipment - Emission requirements	EN 55032	-
		Voltage characteristics of electricity supplied by public electricity networks	EN 50160	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST-TP CLC IEC/TR 63216:2020](https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020)

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>



TECHNICAL REPORT



**Low-voltage switchgear and controlgear – Electromagnetic compatibility
assessment for switchgear and controlgear and their assemblies**

STANDARD PREVIEW
(standards.iteh.ai)

SIST-TP CLC IEC/TR 63216:2020
<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 29.130.20

ISBN 978-2-8322-7542-9

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

CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references	7
3 Terms and definitions	9
4 Classification of the electromagnetic environments.....	11
4.1 General.....	11
4.2 Emission classification	11
4.3 Environments.....	12
4.4 Low voltage supply	14
4.4.1 Nominal voltages	14
4.4.2 Faults in power supply networks	14
4.4.3 Nominal frequencies	14
4.4.4 Electromagnetic disturbances in power supply networks	15
4.5 EMC environment classification	15
4.6 Principle of compatibility	16
5 Drafting of EMC requirements.....	16
5.1 General.....	16
5.2 EMC assessment.....	17
5.3 Drafting of EMC requirements in product and assembly standards	17
6 Radiocommunication	18
6.1 General.....	18
6.2 Radiated emissions.....	18
6.3 Conducted emissions.....	18
6.4 Immunity.....	18
6.4.1 General	18
6.4.2 Radiated immunity	19
6.4.3 Radio frequency (common mode)	19
6.5 Typical radiocommunication standards.....	19
7 EMC related information	19
7.1 Information on the product environment	19
7.2 Information related to emission limits	19
7.3 Instruction for use	20
7.4 Good wiring practices	20
8 Test levels of switchgear and controlgear	20
8.1 Emission limits and test methods	20
8.2 Immunity test levels	21
8.3 Type tests	23
Annex A (informative) Rationale of the electromagnetic compatibility based on the electric network topology	24
A.1 General.....	24
A.2 Overvoltage levels in the installation.....	24
Annex B (informative) Electromagnetic phenomena	25
B.1 EMC phenomena	25
B.1.1 General	25
B.1.2 Voltage dips and short interruptions.....	25

B.1.3	Overvoltages	25
B.1.4	Sine wave disturbances	26
B.1.5	Three-phase system disturbances	26
B.1.6	Electromagnetic disturbances	26
B.1.7	Electromagnetic fields (EMF)	27
B.1.8	Transient	27
B.1.9	Radiated modulated disturbances	27
B.1.10	Radio frequency identification (RFID) systems	27
B.1.11	Radiated pulsed disturbances	28
B.1.12	Electrostatic discharge	28
B.2	Relation between testing standards and basic phenomena	28
	Bibliography	31
	Figure 1 – Ports of entry of electromagnetic disturbances into equipment	11
	Figure 2 – Example of EMC environments	13
	Figure 3 – Principle of EMC compatibility	16
	Figure 4 – CISPR 11:2015, Class A limits (quasi peak) for conducted and radiated emission at 10 m	21
	Table 1 – Typical environment levels	15
	Table 2 – Minimum immunity test levels	21
	Table A.1 – Relation between surge coupling and overvoltage category	24
	Table B.1 – Testing standards covering basic phenomena	29

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>

INTERNATIONAL ELECTROTECHNICAL COMMISSION

LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR –

**Electromagnetic compatibility assessment
for switchgear and controlgear and their assemblies**

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.
<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65->
- 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) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 63216, which is a technical report, has been prepared by subcommittee 121A: Low-voltage switchgear and controlgear, of IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
121A/292/DTR	121A/306A/RVDTR

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

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

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

A bilingual version of this publication may be issued at a later date.

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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[SIST-TP CLC IEC/TR 63216:2020](https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020)

<https://standards.iteh.ai/catalog/standards/sist/749f8d3f-6cbc-4fee-9c65-7c44dae79057/sist-tp-clc-iec-tr-63216-2020>