SLOVENSKI STANDARD
SIST EN 61000-2-2:2003/A1:2018

01-januar-2018

Elektromagnetna združljivost (EMC) - 2-2. del: Okolje - Nivoji združljivosti za nizkofrekvenčne prevodne motnje in signaliziranje v javnih nizkonapetostnih napajalnih sistemih - Dopolnilo A1

Electromagnetic compatibility (EMC) - Part 2-2: Environment - Compatibility levels for low -frequency conducted disturbances and signalling in public low-voltage power supply systems

Elektromagnetische Verträglichkeit (EMV) - Teil 2-2: Umgebungsbedingungen - Verträglichkeitspegel für niederfrequente leitungsgeführte Störgrößen und Signalübertragung in öffentlichen Niederspannungsnetzen

Amendement 1 - Compatibilité électromagnétique (CEM) - Partie 2-2 : Environnement - Niveaux de compatibilité pour les perturbations conduites à basse fréquence et la transmission des signaux sur les réseaux publics d'alimentation basse tension

Ta slovenski standard je istoveten z: **EN 61000-2-2:2002/A1:2017**

ICS:

33.100.01	Elektromagnetna združljivost na splošno	Electromagnetic compatibility in general

SIST EN 61000-2-2:2003/A1:2018 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61000-2-2:2002/A1

October 2017

ICS 33.100.01

English Version

Electromagnetic compatibility (EMC) - Part 2-2: Environment - Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems (IEC 61000-2-2:2002/A1:2017)

Compatibilité électromagnétique (CEM) - Partie 2-2: Environnement - Niveaux de compatibilité pour les perturbations conduites à basse fréquence et la transmission des signaux sur les réseaux publics d'alimentation basse tension (IEC 61000-2-2:2002/A1:2017)

Elektromagnetische Verträglichkeit (EMV) - Teil 2-2: Umgebungsbedingungen - Verträglichkeitspegel für niederfrequente leitungsgeführte Störgrößen und Signalübertragung in öffentlichen Niederspannungsnetzen (IEC 61000-2-2:2002/A1:2017)

This amendment A1 modifies the European Standard EN 61000-2-2:2002; it was approved by CENELEC on 2017-08-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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CENELEC

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

European foreword

The text of document 77A/958/FDIS, future IEC 61000-2-2:2002/A1, prepared by SC 77A "Low frequency phenomena" of IEC/TC 77 "Electromagnetic compatibility" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61000-2-2:2002/A1:2017.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2018-05-01
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2020-08-01

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 Standard IEC 61000-2-2:2002/A1:2017 was approved by CENELEC as a European Standard without any modification.

In the Bibliography of EN 61000-2-2:2002, **Replace** the reference to IEC 61000-2-4 as follows:

IEC 61000-2-4	NOTE	Harmonized as EN 61000-2-4.

In the Bibliography EN 61000-2-2:2002, the following note has to be **added** for the standard indicated

IEC 61000-4-19	NOTE	Harmonized as EN 61000-4-19.

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.

Publication	Year	Title	EN/HD	Year
Addition to Annex ZA of EN 61000-2-2:2002:				
IEC 61000-3-8	-	Electromagnetic compatibility (EMC) - Part 3-8: Limits - Signalling on low-voltage electrical installations - Emission levels, frequency bands and electromagnetic disturbance levels	-	-
CISPR 16-1-1	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-1: Radio disturbance and immunity measuring apparatus - Measuring apparatus	EN 55016-1-1	-
CISPR 16-2-1	-	Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity - Conducted disturbance measurements	EN 55016-2-1	-

IEC 61000-2-2

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AMENDMENT 1

AMENDEMENT 1

Electromagnetic compatibility (EMC) – Part 2-2: Environment – Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems

Compatibilité électromagnétique (CEM) – Partie 2-2: Environnement – Niveaux de compatibilité pour les perturbations conduites à basse fréquence et la transmission des signaux sur les réseaux publics d'alimentation basse tension

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

This amendment has been prepared by subcommittee 77A: EMC – Low frequency phenomena, of IEC technical committee 77: Electromagnetic compatibility.

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

FDIS	Report on voting
77A/958/FDIS	77A/962/RVD

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

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

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

Introduction to Amendment 1

This amendment is related to compatibility levels in the frequency range from 2 kHz to 150 kHz. It contains:

– compatibility levels for signals from mains communicating systems up to 150 kHz;
– compatibility levels for non-intentional emissions between 2 kHz and 30 kHz.

A second amendment is expected soon, containing:

– compatibility levels for non-intentional emissions between 30 kHz and 150 kHz.

1 Scope and object

Replace the existing text with the following new text:

This part of IEC 61000 is concerned with conducted electromagnetic phenomena (disturbances and signals from mains communicating systems) in the frequency range from 0 kHz to 150 kHz. It gives compatibility levels for public low voltage a.c. distribution systems having a nominal voltage up to 420 V, single-phase, or 690 V, three-phase, and a nominal frequency of 50 Hz or 60 Hz.

The compatibility levels specified in this document apply at the point of common coupling. At the power input terminals of equipment receiving its supply from the above systems, the levels of the conducted electromagnetic disturbances can, for the most part, be taken to be the same as the levels at the point of common coupling. In some situations this is not so, particularly in the case of a long line dedicated to the supply of a particular installation, or in

the case of an electromagnetic phenomenon generated or amplified within the installation of which the equipment forms a part.

Compatibility levels are specified for conducted electromagnetic phenomena of the types which can be expected in public low voltage power supply systems, for guidance in the definition of:

– the limits to be set for conducted emissions into public power supply systems (including the planning levels defined in 3.1.5),
– the immunity limits to be set by product committees and others for the equipment exposed to the conducted electromagnetic phenomena present in public power supply systems.

NOTE More information on compatibility levels and other main basic EMC concepts is given in IEC TR 61000-1-1.

The electromagnetic phenomena considered are:

– voltage fluctuations and flicker;
– harmonics up to and including order 40;
– interharmonics up to the 40th harmonic;
– voltage distortion in differential mode at higher frequencies (above the 40th harmonic up to 150 kHz);
– voltage dips and short supply interruptions;
– voltage unbalance;
– transient overvoltages;
– power frequency variation;
– d.c. components;
– signals from mains communicating systems (MCS).

Most of these phenomena are described in IEC TR 61000-2-1. In cases where it is not yet possible to establish compatibility levels, some information is provided in Annex B.

2 Normative references

Add the following new references:

IEC 61000-3-8, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 8: Signalling on low-voltage electrical installations – Emission levels, frequency bands and electromagnetic disturbance levels*

CISPR 16-1-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-1: Radio disturbance and immunity measuring apparatus – Measuring apparatus*

CISPR 16-2-1, *Specification for radio disturbance and immunity measuring apparatus and methods – Part 2-1: Methods of measurement of disturbances and immunity – Conducted disturbance measurements*

3.1 General definitions

Add the following new definitions:

3.1.7
non-intentional emission
conducted emission which is not intended for communication purposes

Note 1 to entry: For the purposes of this document, non-intentional emissions only refer to conducted phenomena.

3.1.8
mains communicating system
MCS
electrical system using mains power lines to transmit information signals, either on the public electricity distribution network or within installations of network users

3.1.9
differential mode voltage
voltage in differential mode
voltage between any two phase conductors or between any phase conductor and the neutral conductor

Note 1 to entry: The voltage distortion in differential mode is the distortion of the voltage in differential mode.

3.1.10
unsymmetrical voltage
voltage between any mains conductor (phase or neutral) and the earth

3.2 Phenomena related definitions

3.2.7
total harmonic distortion
(THD)
Replace, in the explanation below the equation, value H, "...is generally equal to 50, but..." *with* "...is generally equal to 40, but...".

4.3 Harmonics

In Table 1, replace:

$17 \leq h \leq 49$ *with* $17 \leq h \leq 37$,

$21 < h \leq 45$ *with* $21 < h \leq 39$,

$10 \leq h \leq 50$ *with* $10 \leq h \leq 40$.

Add, after the existing subclause 4.4 the following new subclauses:

4.11 Voltage distortion in differential mode above the 40th harmonic up to 9 kHz

In this document, voltage distortion above the 40th harmonic up to 9 kHz is considered in relation to long-term effects, i.e. for a duration of 10 min or longer.

In the case of voltage distortion at frequencies above the 40th harmonic, it is generally not relevant whether they are at harmonic or interharmonic frequencies. They can occur both at discrete frequencies and in relatively broad bands of frequencies.

The compatibility levels for voltage distortion in differential mode above the 40th harmonic (exclusive) up to 9 kHz are given in Table 2. These compatibility levels are related to voltage distortion levels between any two phase conductors or between any phase conductor and the neutral conductor, in a bandwidth of 200 Hz, defined as follows:

$$u_{b,F} = \frac{100}{U_1} \times \sqrt{\sum_{n=1-(100/\Delta f)}^{100/\Delta f} U^2(F + n \cdot \Delta f)}$$

where

F (in Hz)	is the centre frequency of the 200 Hz band under consideration (F is between 2 100 Hz and 8 900 Hz for 50 Hz systems and between 2 500 Hz and 8 900 Hz for 60 Hz systems);
$u_{b,F}$	is the voltage distortion level in the bandwidth of 200 Hz around centre frequency F (expressed in percent of the fundamental component of the voltage U_1);
U_1 (in V)	is the r.m.s. value of the fundamental component of the voltage;
U ($F + n \cdot \Delta f$) (in V)	is the r.m.s. value of the component of the voltage at frequency $f = F + n \cdot \Delta f$ measured with the frequency resolution of Δf (in Hz).

NOTE 1 The 200 Hz bandwidth has been chosen such that it is in accordance with the bandwidth specified in CISPR 16-1-1 for frequencies above 9 kHz.

Table 2 – Compatibility levels for voltage distortion in differential mode $u_{b,F}$ above the 40th harmonic up to 9 kHz

Frequency range kHz	Compatibility levels %
2 (2,4)[a] to 3	1,4
3 to 9	1,4 to 0,65[b]

[a] The frequency range is 2 kHz to 3 kHz for 50 Hz systems and 2,4 kHz to 3 kHz for 60 Hz systems.

[b] The logarithm of the level decreases linearly with the logarithm of the frequency in the range 3 kHz to 9 kHz.

These compatibility levels are reference levels for EMC coordination in the setting of emission limits in differential mode for non-intentional emissions.

NOTE 2 Based on the following assumptions, an emission margin equal to or higher than 3 dB between the equipment emission limits in differential mode for non-intentional emissions and the corresponding compatibility levels is sufficient:

– for each bandwidth of 200 Hz, the probability that the compatibility level is exceeded is lower than 5 %;

– at a given location, the disturbance level in a same bandwidth of 200 Hz does not result from more than two pieces of equipment generating non-intentional emissions close to the emission limit at the same time;

– non-intentional emissions from different equipment are generated independently from each other.

For EMC coordination in the setting of immunity requirements for equipment, the compatibility levels for non-intentional emissions given in Table 2 are reference levels which should be taken into account together with the compatibility levels for MCS signals given in 4.10.2 and 4.10.3.

4.12 Voltage distortion in differential mode from 9 kHz to 150 kHz

4.12.1 General

In this document, voltage distortion from 9 kHz to 150 kHz is considered in relation to long-term effects, i.e. for a duration of 10 min or longer.

The compatibility levels for voltage distortion in differential mode from 9 kHz to 150 kHz, given in 4.12.2 and 4.12.3, are related to disturbance levels between any phase conductor and the neutral conductor measured with a quasi-peak detector and with a bandwidth of 200 Hz in accordance with CISPR 16-1-1.

These compatibility levels for voltage distortion are reference levels for EMC coordination in the setting of emission limits in differential mode for non-intentional emissions. However, if the emission limits are related to voltage distortion levels measured between any mains