SLOVENSKI STANDARD

SIST EN 61000-3-2:1997/A14:2001

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Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase) - Amendment A14

Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

Elektromagnetische Verträglichkeit (EMV) -- Teil 3-2: Grenzwerte - Grenzwerte für Oberschwingungsströme (Geräte-Eingangsstrom bis einschließlich 16 A je Leiter)

Compatibilité électromagnétique (CEM) -- Partie 3-2: Limites - Limites pour les émissions de courant harmonique (courant appelé par les appareils inférieur ou égal à 16 A par phase)

Ta slovenski standard je istoveten z: EN 61000-3-2:1995/A14:2000

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EUROPEAN STANDARD

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English version

Electromagnetic compatibility (EMC)
Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)

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This amendment A14 modifies the European Standard EN 61000-3-2:1995; it was approved by CENELEC on 2000-10-03. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 61000-3-2:1995/A14:2000 E

Foreword

This amendment was prepared by the Technical Committee CENELEC TC 210, Electromagnetic compatibility (EMC).

The text of the draft, which was based on input from IEC SC 77A, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as amendment A14 to EN 61000-3-2:1995 on 2000-10-03.

This amendment provides a temporary solution for legislation in Europe, to be applied from 2001-01-01 together with EN 61000-3-2:1995 (and its amendments) for the EMC Directive.

The following dates were fixed:

- latest date by which the amendment has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2001-01-01
- latest date by which the national standards conflicting with the amendment have to be withdrawn (dow) 2004-01-01

The reference of subclauses, figures and tables which are in addition to those in IEC 61000-3-2 is prefixed with the letter Z.

1 Scope

Delete *the last paragraph:*

"Special equipment...IEC 61000-3-4".

2 Normative references

Replace *the text of clause 2 by:*

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments)

EN 60065	1998	*Audio, video and similar electronic apparatus – Safety requirements (IEC 60065:1998, mod.)*
EN 60107-1	1997	*Methods of measurement on receivers for television broadcast transmissions – Part 1: General considerations – Measurements at radio and video frequencies (IEC 60107-1:1997)*
EN 60155	1995	*Glow-starters for fluorescent lamps (IEC 60155:1993)*
EN 60268-3	2000	*Sound system equipment – Part 3: Amplifiers (IEC 60268-3:2000)*
EN 60335-2-2	1995	*Safety of household and similar electrical appliances – Part 2-2: Particular requirements for vacuum cleaners and water suction cleaning appliances (IEC 60335-2-2:1993, mod.)*
EN 60335-2-7	1997	*Safety of household and similar electrical appliances – Part 2-7: Particular requirements for washing machines (IEC 60335-2-7:1993, mod.)*
EN 61000-4-7	1993	*Part 4-7: Testing and measurement techniques – Section 7: General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto (IEC 61000-4-7:1991)*
IEC 60050-131	1978	*International Electrotechnical Vocabulary (IEV) – Chapter 131: Electric and magnetic circuits*
IEC 60050-161	1990	*International Electrotechnical Vocabulary (IEV) – Chapter 161: Electro-magnetic compatibility*
IEC 61000-2-2	1990	*Electromagnetic compatibility (EMC) – Part 2: Environment – Section 2: Compatibility levels for low-frequency conducted disturbances and signalling in public low-voltage power supply systems*
IEC 61000-3-4	1998	*Electromagnetic compatibility (EMC) - Part 3-4: Limits - Limitation of emission of harmonic currents in low-voltage power supply systems for equipment with rated current greater than 16 A*

3 Definitions

***Add**, after definition 3.13, the following note:*

NOTE The active input power is the active power measured at the input supply terminals of the equipment under test.

***Add** the following new definitions:*

3.Z1
total harmonic current
the total r.m.s. value of the harmonic current components of orders 2 to 40

$$\text{total harmonic current} = \sqrt{\sum_{n=2}^{40} I_n^2}$$

3.Z2
built-in dimmer
a dimmer, including the user control, which is entirely contained within the enclosure of a luminaire

3.Z3
partial odd harmonic current
the total r.m.s. value of the odd harmonic current components of orders 21 to 39

$$\text{partial odd harmonic current} = \sqrt{\sum_{n=21,23}^{39} I_n^2}$$

3.Z4
lighting equipment
equipment with a primary function of generating and/or regulating and/or distributing optical radiation by means of incandescent lamps, discharge lamps or LED's

Included are:

- lamps and lighting luminaires;
- the lighting part of multi-function equipment where one of the primary functions of this is illumination;
- independent ballasts for discharge lamps and independent halogen lamp transformers;
- UV and IR radiation equipment;
- illuminated advertising signs;
- dimmers for lamps other than incandescent.

Excluded are:

- lighting devices built in equipment with another primary purpose such as photocopiers, overhead projectors and slide projectors or employed for scale illuminating or indication purpose;
- dimmers for incandescent lamps.

3.Z5
stand-by mode
a non-operational, low power consumption mode (usually indicated in some way on the equipment) that can persist for an indefinite time

NOTE This mode is sometimes termed 'sleep mode'.

4 General

Add at the end of the clause:

Professional equipment, which does not comply with the requirements of this standard, may be permitted to be connected to certain types of low voltage supplies, if the instruction manual contains a requirement to ask the supply authority for permission to connect. Recommendations concerning this aspect are contained in Technical Report IEC 61000-3-4 or the standard (IEC 61000-3-12, to be published) that will replace it.

5 Classification of equipment

Replace *the text of the entire clause 5 by:*

For the purpose of harmonic current limitation, equipment is classified as follows:

Class A:

- Balanced three-phase equipment;
- Household appliances excluding equipment identified as Class D;
- Tools excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Equipment not specified in one of the three other classes shall be considered as Class A equipment.

NOTE 1 Equipment that can be shown to have a significant effect on the supply system may be reclassified in a future edition of the standard. Factors to be taken into account include:
- number in use;
- duration of use;
- simultaneity of use;
- power consumption;
- harmonic spectrum, including phase.

Class B:

- Portable tools.

Class C:

- Lighting equipment.

Class D:

Equipment having a specified power according to 6.2.2 less than or equal to 600 W, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.

NOTE 2 Class D limits are reserved for equipment that, by virtue of the factors listed in note 1, can be shown to have a pronounced effect on the public electricity supply system.

6 General requirements

6.1 Control methods

Add *before the first paragraph:*

The following restrictions apply even to equipment to which no harmonic current limits apply as defined in clause 7.

Replace *the entire 6.2 by:*

6.2 Harmonic current measurement

6.2.1 Test configuration

Specific test conditions for the measurement of harmonic currents associated with some types of equipment are given in annex C.

For equipment not mentioned in annex C, emission tests shall be conducted with the user's operation controls or automatic programs set to the mode expected to produce the maximum total harmonic current (THC) under normal operating conditions. This defines the equipment set-up during emission tests and not a requirement to measure THC or to conduct searches for worst-case emissions.

The harmonic current limits specified in clause 7 apply to line currents and not to currents in the neutral conductor.

The equipment is tested as presented by and in accordance with information provided by, the manufacturer. Preliminary operation of motor drives by the manufacturer may be needed before the tests are undertaken to ensure that results correspond with normal use.

6.2.2 Measurement procedure

The test shall be conducted according to the general requirements given in 6.2.3. The test duration shall be as defined in 6.2.4.

The measurement of harmonic currents shall be performed as follows:

- for each harmonic order, measure the 1,5 sec smoothed r.m.s. harmonic current in each DFT time window as defined in annex B ,
- calculate the arithmetic average of the measured values from the DFT time windows over the entire observation period as defined in 6.2.4.

The value of input power to be used for the calculation of limits shall be determined as follows:

- measure the 1,5 s smoothed active input power in each DFT time window,
- determine the maximum of the measured values of power from the DFT time windows over the entire duration of the test.

NOTE The active input power supplied to the smoothing section of the measuring instrument as defined in annex B s the active input power in each DFT time window.

The harmonic currents and the active input power shall be measured under the same test conditions but need not be measured simultaneously.

The value for power, measured as defined in this clause, shall be specified by the manufacturer and documented in the test report. This value shall be used for establishing limits during emissions tests when limits are specified in terms of power. In order not to specify a power at which limits change abruptly, thus giving rise to doubt as to which limits apply, the manufacturer may specify any value which is within ± 10 % of the actual measured value.

The value for power found by measurement during emission tests other than the original manufacturer's conformity assessment test, measured according to the terms of this clause, shall not be less than 90 % nor greater than 110 % of the value for power specified by the manufacturer in the test report (see 6.2.3.4). In the event that the measured value is outside of this tolerance band about the specified value, the measured power shall be used to establish the limits.

For Class C equipment, the fundamental current and power factor, specified by the manufacturer, shall be used for the calculation of limits (see 3.12).The fundamental component of current and the power factor are measured and specified by the manufacturer in the same way as the power is measured and specified for the calculation of Class D limits. The value used for power factor shall be obtained from the same DFT measurement window as the value for the fundamental component of current.

6.2.3 General requirements

6.2.3.1 Repeatability

The repeatability of the measurements shall be better than +/- 5 %, when the following conditions are met:

- the same equipment under test (EUT) (not another of the same type, however similar);
- identical test conditions;
- same test system;
- identical climatic conditions, if relevant.

6.2.3.2 Starting and stopping

When a piece of equipment is brought into operation or is taken out of operation, manually or automatically, harmonic currents and power are not taken into account for the first 10 s following the switching event.

The equipment under test shall not be in stand-by mode (see 3.20) for more than 10 % of any observation period.

6.2.3.3 Application of limits

The average value for the individual harmonic currents, taken over the entire test observation period shall be less than or equal to the applicable limits.

For each harmonic order, all 1,5 s smoothed r.m.s. harmonic current values, as defined in 6.2.2, shall be less than or equal to 150 % of the applicable limits.

Harmonic currents less than 0,6 % of the input current measured under the test conditions, or less than 5 mA, whichever is greater, are disregarded.

For the 21st and higher odd order harmonics, the average values obtained for each individual odd harmonic over the full observation period, calculated from the 1,5 s smoothed r.m.s. values according to 6.2.2 may exceed the applicable limits by 50 % provided that the following conditions are met:

- the measured partial odd harmonic current does not exceed the partial odd harmonic current which can be calculated from the applicable limits.
- all 1,5 s smoothed r.m.s. individual harmonic current values shall be less than or equal to 150 % of the applicable limits.

6.2.3.4 Test report

The test report may be based on information supplied by the manufacturer to a testing facility, or be a document recording details of the manufacturer's own tests. It shall include all relevant information for the test conditions, the test observation period, and, when applicable for establishing the limits, the active power or fundamental current and power factor.