# SLOVENSKI STANDARD

# SIST EN 61204-3:2002

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Low-voltage power supplies, d.c. output – Part 3: Electromagnetic compatibility (EMC) (IEC 61204-3:2000)

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ICS 29.200; 33.100.01

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Standard je založil in izdal Slovenski inštitut za standardizacijo. Razmnoževanje ali kopiranje celote ali delov tega dokumenta ni dovoljeno

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# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

## EN 61204-3

December 2000

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English version

## Low voltage power supplies, d.c. output Part 3: Electromagnetic compatibility (EMC) (IEC 61204-3:2000)

Alimentations basse tension, sortie continue Partie 3: Compatibilité électromagnétique (CEM) (CEI 61204-3:2000) Stromversorgungsgeräte für Niederspannung mit Gleichstromausgang Teil 3: Elektromagnetische Verträglichkeit (EMV) (IEC 61204-3:2000)

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This European Standard was approved by CENELEC on 2000-11-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard 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 European Standard 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

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## Foreword

The text of document 22E/75/FDIS, future edition 1 of IEC 61204-3, prepared by SC 22E, Stabilized power supplies, of IEC TC 22, Power electronics, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61204-3 on 2000-11-01.

The following dates were fixed:

| _  | latest date by which the EN has to be implemented<br>at national level by publication of an identical<br>national standard or by endorsement | (dop) 2001-08-01 |
|----|--|------------------|
| -  | latest date by which the national standards conflicting with the EN have to be withdrawn   | (dow) 2003-11-01 |
| Ar | nexes designated "normative" are part of the body of the standard.   |                  |

Annexes designated "informative" are given for information only. In this standard, annexes A, F and ZA are normative and annexes B, C, D, E, G, H and I are informative. Annex ZA has been added by CENELEC.

## **Endorsement notice**

The text of the International Standard IEC 61204-3:2000 was approved by CENELEC as a European Standard without any modification.

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## Annex ZA

(normative)

# Normative references to international publications with their corresponding European publications

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).

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

| Publication            | Year                | <u>Title</u>   | <u>EN/HD</u>                    | Year         |
|------------------------|---------------------|--|---------------------------------|--------------|
| IEC 60050-121          | 1998                | International Electrotechnical Vocabulary<br>Part 121: Electromagnetism  | -                               | -            |
| IEC 60050-131          | 1978                | Chapter 131: Electric and magnetic circuits  | -                               | -            |
| IEC 60050-151          | 1978                | Chapter 151: Electrical and magnetic devices   | -                               | -            |
| IEC 60050-161          | 1990                | Chapter 161: Electromagnetic compatibility   | V                               | -            |
| IEC 60050-551          | 1998                | Part 551 Power electronics eh.ai)  | -                               | -            |
| IEC 60146-1-1          | 1991<br>https://sta | Semiconductor convertors - General<br>requirements and line commutated<br>convertors<br>Part 1-1: Specifications of basic<br>requirements                          | EN 60146-1-1<br>94a1-           | 1993         |
| IEC 60664-1 (mod)      | 1992                | Insulation coordination for equipment within<br>low-voltage systems<br>Part 1: Principles, requirements and tests  | HD 625.1 S1<br>+ corr. November | 1996<br>1996 |
| IEC 61204 (mod)        | 1993                | Low-voltage power supply devices, d.c.<br>output - Performance characteristics and<br>safety requirements  | EN 61204                        | 1995         |
| IEC 61000-3-2<br>(mod) | 2000                | Electromagnetic compatibility (EMC)<br>Part 3-2: Limits - Limits for harmonic current<br>emissions (equipment input current up to<br>and including 16 A per phase) | EN 61000-3-2                    | 2000         |
| IEC 61000-3-3          | 1994                | Part 3-3: Limits - Limitation of voltage<br>fluctuations and flicker in low-voltage supply<br>systems for equipment with rated current up<br>to and including 16 A | EN 61000-3-3<br>+ corr. July    | 1995<br>1997 |
| IEC 61000-4-2          | 1995                | Part 4-2: Testing and measurement techniques - Electrostatic discharge   | EN 61000-4-2                    | 1995         |
| A1                     | 1998                |  | A1                              | 1998         |

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| Publication            | <u>Year</u> | Title  | <u>EN/HD</u>               | Year         |
|------------------------|-------------|--|----------------------------|--------------|
| IEC 61000-4-3<br>(mod) | 1995        | Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test  | EN 61000-4-3               | 1996         |
| IEC 61000-4-4          | 1995        | Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test   | EN 61000-4-4               | 1995         |
| IEC 61000-4-5          | 1995        | Part 4-5: Testing and measurement techniques - Surge immunity test   | EN 61000-4-5               | 1995         |
| IEC 61000-4-6          | 1996        | Part 4-6: Testing and measurement<br>techniques - Immunity to conducted<br>disturbances, induced by radio-frequency<br>fields  | EN 61000-4-6               | 1996         |
| IEC 61000-4-11         | 1994        | Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests  | EN 61000-4-11              | 1994         |
| CISPR 11 (mod)         | 1997<br>iT  | Industrial, scientific and medical (ISM)<br>radio-frequency equipment - Radio<br>disturbance characteristics - Limits and<br>methods of measurement  | EN 55011                   | 1998         |
| CISPR 14-1             | 2000        | Electromagnetic compatibility <b>h.ai</b> )<br>Requirements for household appliances,<br>electric tools and similar apparatus  | EN 55014-1                 | 2000         |
| CISPR 16-1             | 1999        | bd2d13053866/sist-en-61204-3-2002<br>Specification for radio disturbance and<br>immunity measuring apparatus and<br>methods<br>Part 1: Radio disturbance and immunity<br>measuring apparatus | -                          | -            |
| CISPR 22 (mod)         | 1997        | Information technology equipment - Radio<br>disturbance characteristics - Limits and<br>methods of measurement   | EN 55022<br>+ corr. August | 1998<br>1999 |
| ISO/IEC Guide 25       | 1990        | General requirements for the competence of calibration and testing laboratories  |                            | -            |

# NORME INTERNATIONALE INTERNATIONAL STANDARD

CEI **IEC** 61204-3

Première édition First edition 2000-11

Alimentations basse tension, sortie continue –

## Partie 3: Compatibilité électromagnétique (CEM)

## i Teh STANDARD PREVIEW Low-voltage power supplies, d.c. output – (standards.iteh.ai) Part 3: Electromagnetic compatibility (EMC)

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Commission Electrotechnique Internationale International Electrotechnical Commission Международная Электротехническая Комиссия





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### INTERNATIONAL ELECTROTECHNICAL COMMISSION

### LOW VOLTAGE POWER SUPPLIES, DC OUTPUT -

### Part 3: Electromagnetic compatibility (EMC)

#### FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards?
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights. International Standard IEC 61204-3 has been prepared by subcommittee 22E: Stabilized power supplies, of IEC technical committee 22: Power electronics.

International Standard IEC 61204-3 has been prepared by subcommittee 22E: Stabilized power supplies, of IEC technical committee 22: Power electronics.

IEC 61204-3 cancels and replaces IEC 60478-3 published in 1989.

IEC 61204-3 has the status of a product standard.

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

| FDIS        | Report on voting |
|-------------|------------------|
| 22E/75/FDIS | 22E/78/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 ISO/IEC Directives, Part 3.

Annexes A and F form an integral part of this standard.

Annexes B, C, D, E, G, H and I are for information only.

The contents of the corrigendum of December 2000 have been included in this copy.

IEC 61204 consists of the following parts, under the general title: *Low voltage power supplies, d.c. output* 

Part 1: Terms and definitions <sup>1)</sup>

Part 2: Performance characteristics 1)

- Part 3: Electromagnetic compatibility (EMC)
- Part 4: Tests other than EMC 1)
- Part 5: Measurement of the magnetic component of the reactive near field <sup>1)</sup>
- Part 6: Requirements for low-voltage power supplies of assessed performance <sup>2)</sup>

Part 7: Safety requirements 1)

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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

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<sup>2)</sup> To be published.

<sup>&</sup>lt;sup>1)</sup> Under consideration.

## LOW VOLTAGE POWER SUPPLIES, DC OUTPUT –

## Part 3: Electromagnetic compatibility (EMC)

#### 1 Scope and object

This part of IEC 61204 specifies electromagnetic compatibility (EMC) requirements for power supply units (PSUs) providing d.c. output(s) up to 200 V at a power level of up to 30 kW, operating from a.c. or d.c. source voltages of up to 600 V.

The devices are for free-standing operation or for use in other equipment when used with adequate electrical and mechanical protection.

For certain specialized industrial PSUs, for example in the chemical and metallurgical industry, other product EMC standards may exist. In this case these standards can be used as an alternative.

Since many PSUs are used as components of larger units which are covered by different EMC standards, a classification of power supplies and the applicability of the relevant EMC standards is given in items a) and b) below. Further guidelines on classification are given in annex A.

a) Power supplies intended for free-standing operation (individual apparatus).

This part of IEC 61204 is applicable to PSUs developed as a unit with a direct function and sold on the market as a stand-alone unit. 61204-3:2002

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b) Component power supplies bd2d13053866/sist-en-61204-3-2002

These can be divided into two categories:

1) Component power supplies considered as equivalent to apparatus.

This part of IEC 61204 is applicable to this category of component PSUs. These PSUs are considered to be apparatus with respect to their EMC requirements, for example those PSUs intended for use in installations or sold to the general public, cases where no further EMC tests are anticipated. This does not include PSUs sold as spares for repair which have been tested as part of an overall equipment.

2) Component power supplies intended for a professional assembler/installer

This part of IEC 61204 is applicable to this category of power supplies only as an aid to specify relevant EMC requirements in order that various end product standards may be met.

These are component power supplies that are intended for incorporation into a final product by a professional assembler. These products may be sold to a professional assembler or placed on the market for specialized distribution and use. In neither case do they perform in themselves a direct function for the user of an end-product. Further EMC tests of the assembly are assumed.

NOTE After incorporation into a final product, the emission values can be altered (e.g. because of modified earth connections).

The object of this part of IEC 61204 is to define EMC limits and test methods for PSUs. It includes limits for electromagnetic emissions which may cause interference to other electronic equipment (e.g. radio receivers, measuring and computer devices), as well as electromagnetic immunity limits for continuous and transient conducted and radiated disturbances including electrostatic discharges.

This part of IEC 61204 defines the minimum electromagnetic compatibility requirements for PSUs.

To comply with this part of IEC 61204, no additional EMC tests are required or necessary beyond those stated here.

#### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 61204. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of IEC 61204 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60050-121, International Electrotechnical Vocabulary (IEV) – Part 121: Electromagnetism

IEC 60051(131), International Electrotechnical Vocabulary (IEV) – Chapter 131: Electric and magnetic circuits

IEC 60050(151), International Electrotechnical Vocabulary (IEV) – Chapter 151: Electrical and magnetic devices https://standards.iteh.ai/catalog/standards/sist/7cbef3cb-72d6-4afc-b4a1-bd2d13053866/sist-en-61204-3-2002

IEC 60050(161), International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility

IEC 60050-551, International Electrotechnical Vocabulary (IEV) – Part 551: Power electronics

IEC 60146-1-1, Semiconductor convertors – General requirements and line commutated convertors – Part 1-1: Specifications of basic requirements

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

IEC 61204, *Low-voltage power supply devices, d.c. output – Performance characteristics and safety requirements* (future IEC 61204-2)

IEC 61000-3-2, Electromagnetic compatibility (EMC) – Part 3: Limits – Section 2: Limits for harmonic current emissions (equipment input current  $\leq$ 16 A per phase) \*

<sup>\*</sup> There is a consolidated edition 1.2 (1998) that includes IEC 61000-3-2 (1995), and its amendment 1 (1997) and its amendment 2 (1998).