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## **Elektromagnetisk kompatibilitet (EMC) – Del 4-1: Mät- och provningsmetoder – Översikt av immunitetsprovningar**

*Electromagnetic compatibility (EMC) –  
Part 4-1: Testing and measurement techniques –  
Overview of IEC 61000-4 series*

Som svensk standard gäller europastandarden EN 61000-4-1:2007. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61000-4-1:2007.

### **Nationellt förord**

Europastandarden EN 61000-4-1:2007

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61000-4-1, Third edition, 2006 - Electromagnetic compatibility (EMC) - Part 4-1: Testing and measurement techniques - Overview of IEC 61000-4 series**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61000-4-1, utgåva 2, 2000, gäller ej fr o m 2010-02-01.

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a säkerhet, prestanda, dokumentation, utförande och skötsel av elprodukter, elanläggningar och metoder. Genom att utforma sådana standarder blir säkerhetskraven tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

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Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

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### **SEK Svensk Elstandard**

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English version

**Electromagnetic compatibility (EMC) -  
Part 4-1: Testing and measurement techniques -  
Overview of IEC 61000-4 series  
(IEC 61000-4-1:2006)**

Compatibilité électromagnétique (CEM) -  
Partie 4-1: Techniques d'essai  
et de mesure -  
Vue d'ensemble de la série CEI 61000-4  
(CEI 61000-4-1:2006)

Elektromagnetische Verträglichkeit  
(EMV) -  
Teil 4-1: Prüf- und Messverfahren -  
Übersicht über die Reihe IEC 61000-4  
(IEC 61000-4-1:2006)

This European Standard was approved by CENELEC on 2007-02-01. 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, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the 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**

## Foreword

The text of document 77/319/FDIS, future edition 3 of IEC 61000-4-1, prepared by IEC TC 77, Electromagnetic compatibility, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61000-4-1 on 2007-02-01.

This European Standard supersedes EN 61000-4-1:2000.

Changes introduced in EN 61000-4-1:2007 are for the purpose of updating the text to include reference to the latest publications of the EN 61000-4 series.

The following dates were fixed:

- |                                                                                                                                          |       |            |
|------------------------------------------------------------------------------------------------------------------------------------------|-------|------------|
| – latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement | (dop) | 2007-11-01 |
| – latest date by which the national standards conflicting with the EN have to be withdrawn                                               | (dow) | 2010-02-01 |

Annex ZA has been added by CENELEC.

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## Endorsement notice

The text of the International Standard IEC 61000-4-1:2006 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

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

| <u>Publication</u>        | <u>Year</u>     | <u>Title</u>                                                                                                                                                                                                                                                    | <u>EN/HD</u>                 | <u>Year</u>                |
|---------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------------------|
| IEC 60050-161             | - <sup>1)</sup> | International Electrotechnical Vocabulary (IEV) - Chapter 161: Electromagnetic compatibility                                                                                                                                                                    | -                            | -                          |
| IEC/TR 61000-1-1          | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 1: General - Section 1: Application and interpretation of fundamental definitions and terms                                                                                                                          | -                            | -                          |
| IEC 61000-2-5             | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 2: Environment - Section 5: Classification of electromagnetic environments                                                                                                                                           | -                            | -                          |
| IEC 61000-3-2             | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current $\leq 16$ A per phase)                                                                                                                  | EN 61000-3-2                 | 2006 <sup>2)</sup>         |
| IEC 61000-3-3             | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current $\leq 16$ A per phase and not subject to conditional connection | EN 61000-3-3<br>+ corr. July | 1995 <sup>2)</sup><br>1997 |
| IEC/TS 61000-3-4          | - <sup>1)</sup> | 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                                                                     | -                            | -                          |
| IEC/TS 61000-3-5<br>(mod) | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 3: Limits - Section 5: Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 16 A                                                         | -                            | -                          |
| IEC 61000-3-6             | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 3: Limits - Section 6: Assessment of emission limits for distorting loads in MV and HV power systems                                                                                                                 | -                            | -                          |

<sup>1)</sup> Undated reference.

<sup>2)</sup> Valid edition at date of issue.

| <u>Publication</u> | <u>Year</u>    | <u>Title</u>                                                                                                                                                                                                                                    | <u>EN/HD</u>  | <u>Year</u>        |
|--------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|
| IEC 61000-3-11     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current $\leq 75$ A and subject to conditional connection | EN 61000-3-11 | 2000 <sup>2)</sup> |
| IEC 61000-3-12     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current $> 16$ A and $\leq 75$ A per phase                                      | EN 61000-3-12 | 2005 <sup>2)</sup> |
| IEC 61000-4-2      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test                                                                                                                      | EN 61000-4-2  | 1995 <sup>2)</sup> |
| IEC 61000-4-3      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test                                                                                             | EN 61000-4-3  | 2006 <sup>2)</sup> |
| IEC 61000-4-4      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test                                                                                                              | EN 61000-4-4  | 2004 <sup>2)</sup> |
| IEC 61000-4-5      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test                                                                                                                                        | EN 61000-4-5  | 2006 <sup>2)</sup> |
| IEC 61000-4-6      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields                                                                                      | -             | -                  |
| IEC 61000-4-7      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-7: Testing and measurement techniques - General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto                   | EN 61000-4-7  | 2002 <sup>2)</sup> |
| IEC 61000-4-8      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test                                                                                                               | EN 61000-4-8  | 1993 <sup>2)</sup> |
| IEC 61000-4-9      | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-9: Testing and measurement techniques - Pulse magnetic field immunity test                                                                                                                         | EN 61000-4-9  | 1993 <sup>2)</sup> |
| IEC 61000-4-10     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-10: Testing and measurement techniques - Damped oscillatory magnetic field immunity test                                                                                                           | EN 61000-4-10 | 1993 <sup>2)</sup> |

| <u>Publication</u> | <u>Year</u>    | <u>Title</u>                                                                                                                                                                                   | <u>EN/HD</u>  | <u>Year</u>        |
|--------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|
| IEC 61000-4-11     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests                                  | EN 61000-4-11 | 2004 <sup>2)</sup> |
| IEC 61000-4-12     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-12: Testing and measurement techniques - Ring wave immunity test                                                                                  | EN 61000-4-12 | 2006 <sup>2)</sup> |
| IEC 61000-4-13     | <sup>-1)</sup> | 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 | 2002 <sup>2)</sup> |
| IEC 61000-4-14     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-14: Testing and measurement techniques - Voltage fluctuation immunity test                                                                        | EN 61000-4-14 | 1999 <sup>2)</sup> |
| IEC 61000-4-15     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-15: Testing and measurement techniques - Flickermeter - Functional and design specifications                                                      | EN 61000-4-15 | 1998 <sup>2)</sup> |
| IEC 61000-4-16     | <sup>-1)</sup> | 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 | 1998 <sup>2)</sup> |
| IEC 61000-4-17     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-17: Testing and measurement techniques - Ripple on d.c. input power port immunity test                                                            | EN 61000-4-17 | 1999 <sup>2)</sup> |
| IEC 61000-4-18     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-18: Testing and measurement techniques - Oscillatory wave immunity test                                                                           | -             | -                  |
| IEC 61000-4-20     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-20: Testing and measurement techniques - Emission and immunity testing in transverse electromagnetic (TEM) waveguides                             | EN 61000-4-20 | 2003 <sup>2)</sup> |
| IEC 61000-4-21     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-21: Testing and measurement techniques - Reverberation chamber test methods                                                                       | EN 61000-4-21 | 2003 <sup>2)</sup> |
| IEC 61000-4-23     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4-23: Testing and measurement techniques - Test methods for protective devices for HEMP and other radiated disturbances                             | EN 61000-4-23 | 2000 <sup>2)</sup> |
| IEC 61000-4-24     | <sup>-1)</sup> | Electromagnetic compatibility (EMC) - Part 4: Testing and measurement techniques - Section 24: Test methods for protective devices for HEMP conducted disturbance                              | EN 61000-4-24 | 1997 <sup>2)</sup> |

| <u>Publication</u> | <u>Year</u>     | <u>Title</u>                                                                                                                                                                                                            | <u>EN/HD</u>  | <u>Year</u>        |
|--------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|--------------------|
| IEC 61000-4-25     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-25: Testing and measurement techniques - HEMP immunity test methods for equipment and systems                                                                              | EN 61000-4-25 | 2002 <sup>2)</sup> |
| IEC 61000-4-27     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-27: Testing and measurement techniques - Unbalance, immunity test                                                                                                          | EN 61000-4-27 | 2000 <sup>2)</sup> |
| IEC 61000-4-28     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-28: Testing and measurement techniques - Variation of power frequency, immunity test                                                                                       | EN 61000-4-28 | 2000 <sup>2)</sup> |
| IEC 61000-4-29     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests                                  | EN 61000-4-29 | 2000 <sup>2)</sup> |
| IEC 61000-4-30     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-30: Testing and measurement techniques - Power quality measurement methods                                                                                                 | EN 61000-4-30 | 2003 <sup>2)</sup> |
| IEC/TR 61000-4-32  | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-32: Testing and measurement techniques - High-altitude electromagnetic pulse (HEMP) simulator compendium                                                                   | -             | -                  |
| IEC 61000-4-33     | - <sup>1)</sup> | Electromagnetic compatibility (EMC) - Part 4-33: Testing and measurement techniques - Measurement methods for high-power transient parameters                                                                           | -             | -                  |
| IEC 61000-4-34     | - <sup>1)</sup> | 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 | -             | -                  |

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## **ELECTROMAGNETIC COMPATIBILITY (EMC) –**

### **Part 4-1: Testing and measurement techniques – Overview of IEC 61000-4 series**

#### **1 Scope and object**

This part of IEC 61000 covers testing and measuring techniques for electric and electronic equipment (apparatus and systems) in its electromagnetic environment.

The object of this part is to give applicability assistance to the technical committees of IEC or other bodies, users and manufacturers of electrical and electronic equipment on EMC standards within the IEC 61000-4 series on testing and measurement techniques and to provide general recommendations concerning the choice of relevant tests.

#### **2 Normative references**

The following referenced documents are indispensable for the application 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(161), *International Electrotechnical Vocabulary (IEV) – Chapter 161: Electromagnetic compatibility*

IEC 61000-1-1, *Electromagnetic Compatibility (EMC) – Part 1-1: General – Application and interpretation of fundamental definitions and terms*

IEC 61000-2-5, *Electromagnetic Compatibility (EMC) – Part 2: Environment – Classification of electromagnetic environments*

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

IEC 61000-3-3, *Electromagnetic compatibility (EMC) – Part 3-3: Limits –Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection*

IEC/TS 61000-3-4, *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*

IEC/TR 61000-3-5, *Electromagnetic compatibility (EMC) – Part 3-5: Limits – Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 16 A*

IEC 61000-3-6, *Electromagnetic compatibility (EMC) – Part 3: Limits – Section 6: Assessment of emission limits for distorting loads in MV and HV power systems*