

**Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings -- Part 1: Requirements for measuring instruments**

## EESTI STANDARDI EESSÕNA

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|---|--|
| See Eesti standard EVS-EN 61786-1:2014 sisaldab Euroopa standardi EN 61786-1:2014 inglisekeelset teksti.            | This Estonian standard EVS-EN 61786-1:2014 consists of the English text of the European standard EN 61786-1:2014.                  |
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**Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings -  
Part 1: Requirements for measuring instruments  
(IEC 61786-1:2013)**

Mesure de champs magnétiques continus et de champs magnétiques et électriques alternatifs dans la plage de fréquences de 1 Hz à 100 kHz dans leur rapport à l'exposition humaine -  
Partie 1: Exigences applicables aux instruments de mesure  
(CEI 61786-1:2013)

Messung von magnetischen Gleichfeldern und von elektrischen und magnetischen Wechselfeldern von 1 Hz bis 100 kHz im Hinblick auf die Exposition von Personen -  
Teil 1: Anforderungen an Messgeräte  
(IEC 61786-1:2013)

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## Foreword

The text of document 106/292/FDIS, future edition 1 of IEC 61786-1, prepared by IEC TC 106, Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61786-1:2014.

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) 2014-10-16
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-01-16

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## Endorsement notice

The text of the International Standard IEC 61786-1:2013 was approved by CENELEC as a European Standard without any modification.

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

|                    |      |   |
|--------------------|------|---|
| IEC 62110:2009     | NOTE | Harmonised as EN 62110:2009 (not modified).         |
| ISO 80000-1:2009   | NOTE | Harmonised as EN ISO 80000-1:2013 (not modified).   |
| ISO/IEC 17025:2005 | NOTE | Harmonised as EN ISO/IEC 17025:2005 (not modified). |

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 61000-3-2      | -           | Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current $\leq 16$ A per phase)             | EN 61000-3-2 | -           |
| IEC 61000-4-2      | -           | Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test                                 | EN 61000-4-2 | -           |
| 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 61000-4-6      | -           | 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 | -           |
| CISPR 11 (mod)     | -           | Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement                             | EN 55011     | -           |
| ISO/IEC Guide 98-3 | -           | Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)  | -            | -           |
| IEC Guide 108      | -           | Guidelines for ensuring the coherency of IEC publications - Application of horizontal standards  | -            | -           |

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# **MEASUREMENT OF DC MAGNETIC, AC MAGNETIC AND AC ELECTRIC FIELDS FROM 1 Hz TO 100 kHz WITH REGARD TO EXPOSURE OF HUMAN BEINGS –**

## **Part 1: Requirements for measuring instruments**

### **1 Scope**

This part of IEC 61786 provides guidance for measuring instruments used to measure the field strength of quasi-static magnetic and electric fields that have a frequency content in the range 1 Hz to 100 kHz and with DC magnetic fields to evaluate the exposure levels of the human body to these fields.

Sources of fields include devices that operate at power frequencies and produce power frequency and power frequency harmonic fields, as well as devices that produce fields within the frequency range of this document, including devices that produce static fields, and the earth's static magnetic field. The magnitude ranges covered by this standard are 0,1  $\mu$ T to 200 mT in AC (1  $\mu$ T to 10 T in DC) and 1 V/m to 50 kV/m for magnetic fields and electric fields, respectively.

When measurements outside this range are performed, most of the provisions of this standard will still apply, but special attention should be paid to specified uncertainty and calibration procedures.

Specifically, this standard

- defines terminology;
- identifies requirements on field meter specifications;
- indicates methods of calibration;
- defines requirements on instrumentation uncertainty;
- describes general characteristics of fields;
- describes operational principles of instrumentation.

NOTE Measurement methods that achieve defined goals pertaining to assessment of human exposure are described in IEC 61786-2

Sources of uncertainty during calibration are also identified. In regard to electric field measurements, this standard considers only the measurement of the unperturbed electric field strength at a point in free space (i.e. the electric field prior to the introduction of the field meter and operator) or above conducting surfaces.

This horizontal standard is primarily intended for use by technical committees in the preparation of standards in accordance with the principles laid down in IEC Guide 108.

One of the responsibilities of a technical committee is, wherever applicable, to make use of horizontal standards in the preparation of its publications. The contents of this horizontal standard will not apply unless specifically referred to or included in the relevant publications.

### **2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For