



BSI Standards Publication

# 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

**National foreword**

This British Standard is the UK implementation of EN 61786-1:2014. It is identical to IEC 61786-1:2013.

The UK participation in its preparation was entrusted to Technical Committee GEL/106, Human exposure to low frequency and high frequency electromagnetic radiation.

A list of organizations represented on this committee can be obtained on request to its secretary.

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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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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Avenue Marnix 17, B - 1000 Brussels**

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-01-16

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

## 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	-	-

## CONTENTS

1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	7
3.1	Meters .....	7
3.2	Meter characteristics .....	8
3.3	Field characteristics .....	9
3.4	Measurements .....	10
4	Symbols .....	11
5	Instrumentation specifications .....	12
5.1	General .....	12
5.2	Measurement uncertainty .....	12
5.3	Magnitude range .....	13
5.4	Pass-band .....	13
5.5	Operating temperature and humidity ranges .....	13
5.6	Power supplies .....	13
5.7	Readability of scale .....	14
5.8	Instrument dimensions and choice of probe .....	14
5.8.1	General schema .....	14
5.8.2	Magnetic field meter .....	14
5.8.3	Electric field meter .....	15
5.8.4	Support for electric field meter .....	15
5.9	Electromagnetic compatibility .....	15
5.9.1	Immunity .....	15
5.9.2	Emissions .....	16
5.10	Crest factor .....	17
5.11	Durability .....	17
5.12	Weight .....	17
5.13	Instrumentation choice .....	18
6	Calibration .....	18
6.1	General .....	18
6.2	Calibration procedure .....	18
6.2.1	General .....	18
6.2.2	Magnetic field calibration system .....	18
6.2.3	Electric field calibration system .....	19
6.2.4	Three-axis probes calibration .....	19
6.2.5	Calibration values .....	19
6.2.6	Calibration uncertainty .....	20
6.3	Calibration documentation .....	20
7	Verification .....	21
	Annex A (normative) Calibration methods .....	22
	Annex B (informative) Example of calibration uncertainty .....	33
	Annex C (informative) General characteristics of magnetic and electric fields .....	35
	Annex D (informative) Magnetic flux density meters (magnetic field meters) .....	39

Annex E (informative) Electric field strength meters (electric field meters) .....	43
Annex F (informative) Influence of humidity on electric field measurement .....	47
Annex G (informative) Units .....	49
Bibliography.....	50
Figure 1 – Schema of a field meter .....	14
Figure 2 – Insulating tripod and offset rod for an electric field probe (photograph RTE).....	15
Figure 3 – Electric field measurement using a hand-held stick (photograph RTE).....	15
Figure A.1 – Deviation in percentage departure of calculated axial field [7] .....	22
Figure A.2 – Coordinate system and geometry of rectangular loop of many turns of wire (see Equation (A. 1)) .....	23
Figure A.3 – Circular Helmholtz coils .....	24
Figure A.4 – Deviation in percentage of calculated $B_z$ from centre value (see Equation (A.4)) .....	25
Figure A.5 – Schematic view of a circuit for calibration of magnetic field meter using a square loop to produce a known field .....	25
Figure A.6 – Diagram for voltage injection technique .....	27
Figure A.7 – Calculated normalized electric field at plate surfaces and midway between plates as a function of the normalized distance from the edge of the plate .....	28
Figure A.8 – Parallel plates system for calibrating free-body electric field meters.....	30
Figure A.9 – Arrangement with parallel plates orientated perpendicular to the floor.....	31
Figure A.10 – Diagram for current injection technique .....	32
Figure C.1 – Oscillating and rotating field quantities for cases of elliptical polarization, linear polarization, and circular polarization .....	36
Figure C.2 – Magnetic field from current in straight and circular conductors .....	37
Figure C.3 – Perturbation of electric field distribution $B$ by a person (from IEC 62226-3-1).....	38
Figure C.4 – Proximity effect with a 25 kV line and a building (from IEC 62110).....	38
Figure D.1 – Schematic view of simple magnetic field meter with coil-type probe .....	39
Figure D.2 – Approximate equivalent circuit of a coil probe when connected to the detector .....	41
Figure E.1 – Single-axis free-body meter geometries .....	44
Figure E.2 – Designs for flat plate probes used with ground-referenced electric field meters .....	45
Figure F.1 – Test in the climatic chamber with the normal tripod (left) and the offset tripod (right) (photograph EDF R&D).....	47
Figure F.2 – E field measured as a function of the humidity with a normal tripod.....	48
Figure F.3 – E field measured as a function of the humidity with an offset tripod.....	48
Table 1 – Mains terminal disturbance voltage limits for class B group 1 equipment measured on a test site.....	17
Table A.1 – Calculated normalized electric field values midway between plates and at plate surfaces .....	30
Table B.1 – Example of uncertainty calculation .....	33

# 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