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# Electric and magnetic field levels generated by AC power systems — Measurement procedures with regard to public exposure (IEC 62110:2009/COR1:2015, MOD)

AS/NZS 62110:2021

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Commercial Radio Australia
Communications, Electrical and Plumbing Union — Electrical Division
Department of Defence (Australian Government)
Electrical Engineers Association of NZ
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Australian/New Zealand Standard™

# Electric and magnetic field levels generated by AC power systems — Measurement procedures with regard to public exposure (IEC 62110:2009/COR1:2015, MOD)

First published as AS/NZS 62110:2021.

# Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee TE-007, Human Exposure to Electromagnetic Fields.

The objective of this document is to establish measurement procedures for electric and magnetic field levels generated by AC power systems to evaluate the exposure levels of the human body to these fields.

This document is applicable to public exposure in the domestic environment and in areas accessible to the public.

This document specifies fundamental procedures for the measurement of fields, and, with regard to human exposure, for obtaining a field value that corresponds to a spatial average over the entire human body.

This document is not applicable to DC power transmission systems.

This document is not applicable to occupational exposure associated with, for example, the operation and/or maintenance of the power systems. Such exposure may occur when working inside a distribution or transmission substation, a power plant, in a manhole or a tunnel for underground cables, or on an overhead line tower or pole.

This document an adoption with national modifications, and has been reproduced from, IEC 62110:2009, *Electric and magnetic field levels generated by AC power systems — Measurement procedures with regard to public exposure* and its Corrigendum No 1 (2015) which has been added at the end of the source text.

The modifications are additional requirements and are set out in Appendix ZZ, which has been added after Corrigendum No 1.

Appendix ZZ lists the variations to IEC 62110:2009 for the application of this document in Australia and New Zealand.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

# ELECTRIC AND MAGNETIC FIELD LEVELS GENERATED BY AC POWER SYSTEMS – MEASUREMENT PROCEDURES WITH REGARD TO PUBLIC EXPOSURE

## FOREWORD

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International Standard IEC 62110 has been prepared by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure.

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

| FDIS | Report on voting |
|---|---|
| 106/177/FDIS | 106/185/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 the ISO/IEC Directives, Part 2.

Terms defined in Clause 3 appear in *italics* throughout the document.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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

The contents of the corrigendum of January 2015 have been included in this copy.

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# INTRODUCTION

All populations of the world are now exposed to electric and magnetic fields and the levels will continue to increase with developing industry and technology. A number of countries have implemented regulations on public exposure to these fields. Therefore, in order to evaluate human exposure levels to these fields adequately, common measurement procedures are required by not only professionals of national authorities and electric power industries, but also the general public.

This standard is applied to the measurement of fields generated by AC power systems in areas accessible to the public. It establishes a common measurement procedure to evaluate the exposure levels of the human body to electric and magnetic fields among the general public.

The values obtained are for use to determine whether the fields comply with exposure limits by comparing them with the field limits for general public exposure such as the reference levels from the ICNIRP (International Commission on Non-Ionizing Radiation Protection) Guidelines [1][1)], MPE (maximum permissible exposure) from the IEEE (Institute of Electrical and Electronics Engineers) [2] or in national regulations. If the values obtained are higher than the reference level or MPE, it does not necessarily mean that the basic restriction has been exceeded, in which case other methods must be used to ensure that basic restriction is not exceeded.

The values obtained by using the procedures in this standard are for the load conditions occurring at the time of measurement. Therefore, in the case of magnetic field, in order to check compliance with some exposure guidelines or regulations these values may need to be extrapolated to take account of the maximum load of the circuits.

This standard is not applicable to occupational exposure associated with, for example, the operation and/or maintenance of the power systems. Such exposure may occur when working inside a distribution or transmission substation, a power plant, in a manhole or a tunnel for underground cables, or on an overhead line tower or pole.

1) Numbers in square brackets refers to the Bibliography.

# ELECTRIC AND MAGNETIC FIELD LEVELS GENERATED BY AC POWER SYSTEMS – MEASUREMENT PROCEDURES WITH REGARD TO PUBLIC EXPOSURE

## 1 Scope

This International Standard establishes measurement procedures for electric and magnetic field levels generated by AC power systems to evaluate the exposure levels of the human body to these fields. This standard is not applicable to DC power transmission systems.

This International Standard is applicable to public exposure in the domestic environment and in areas accessible to the public.

This standard specifies fundamental procedures for the measurement of fields, and, with regard to human exposure, for obtaining a field value that corresponds to a spatial average over the entire human body.

This standard is not applicable to occupational exposure associated with, for example, the operation and/or maintenance of the power systems. Such exposure may occur when working inside a distribution or transmission substation, a power plant, in a manhole or a tunnel for underground cables, or on an overhead line tower or pole.

## 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 61786, *Measurement of low-frequency magnetic and electric fields with regard to exposure of human beings – Special requirements for instruments and guidance for measurements*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions given below apply. Internationally accepted SI-units are used throughout the standard.

NOTE The distinction between “magnetic flux density” and “magnetic field strength” is only relevant when considering magnetic fields in magnetic materials. In air it is common to use “magnetic fields” as a generic term to cover both of these two quantities.

**3.1**
**single-point measurement**
procedure to measure the field level at a specified height, used for uniform fields

NOTE The conditions under which the field can be considered as uniform or non-uniform are given in section 5.1.

**3.2**
**three-point measurement**
procedure to measure the field levels at three specified heights at a single location, used for non-uniform fields