IEC PAS 63184

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PUBLICLY AVAILABLE SPECIFICATION

PRE-STANDARD

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Assessment methods of the human exposure to electric and magnetic fields from wireless power transfer systems – Models, instrumentation, measurement and numerical methods and procedures (frequency range of 1 kHz to 30 MHz)

IEC PAS 63184:2021-05(en)

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ASSESSMENT METHODS OF THE HUMAN EXPOSURE TO ELECTRIC AND MAGNETIC FIELDS FROM WIRELESS POWER TRANSFER SYSTEMS – MODELS, INSTRUMENTATION, MEASUREMENT AND NUMERICAL METHODS AND PROCEDURES (FREQUENCY RANGE OF 1 kHz TO 30 MHz)

FOREWORD

A PAS is an intermediate specification made available to the public and needing a lower level of consensus than an International Standard to be approved by vote (simple majority).

IEC PAS 63184 has been processed by IEC technical committee 106: Methods for the assessment of electric, magnetic and electromagnetic fields associated with human exposure.

The text of this PAS is based on the following document:	This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document
Draft PAS	**Report on voting**
106/529/DPAS	106/532/RVDPAS

Following publication of this PAS, which is a pre-standard publication, the technical committee or subcommittee concerned may transform it into an International Standard.

This PAS shall remain valid for an initial maximum period of 2 years starting from the publication date. The validity may be extended for a single period up to a maximum of 2 years, at the end of which it shall be published as another type of normative document, or shall be withdrawn.

IMPORTANT – The "colour inside" logo on the cover page of this document indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The scope of this document falls under the IEC work item "development of standard for measurement and calculation methods used to assess human exposure to electric, magnetic and electromagnetic fields." Wireless power transfer (WPT) is the transmission of electrical power from a transmitter to a receiver without current-carrying wires. This technology is increasingly being implemented in a wide range of applications at different frequency ranges from consumer electronics (e.g. mobile phones, tablet PCs) to automotive (electric vehicles (EVs)). The human exposure is limited to avoid hazardous nerve effects (< 10 MHz) and thermal effects (> 100 kHz). An ITU-R published report (ITU-R SM. 2303-1) from June 2015 on WPT systems describes RF exposure assessment methodologies, yet no definitive assessment method was introduced. An exposure assessment method of WPT for EV was described in IEC 61980-3:2019, however, there is currently no other product standard related to WPT. As WPT systems will become ubiquitous in a multitude of applications in the near future, IEC and IEEE established a joint working group to address WPT assessment methods related to human exposures to electric, magnetic and electromagnetic fields.

In this document, IEC TC 106 describes the basic methods to assess the direct and indirect effects of exposure to WPT systems, case studies, and relevant research. These methods mainly focus on frequency up to 30 MHz to consider both stimulation and thermal effects. The document specifies:

- assessment procedures (Clause 5);
- measurement methods (Clause 6);
- numerical assessment methods (Clause 7);
- assessment combining measurement and numerical methods (Clause 8).

ASSESSMENT METHODS OF THE HUMAN EXPOSURE TO ELECTRIC AND MAGNETIC FIELDS FROM WIRELESS POWER TRANSFER SYSTEMS – MODELS, INSTRUMENTATION, MEASUREMENT AND NUMERICAL METHODS AND PROCEDURES (FREQUENCY RANGE OF 1 kHz TO 30 MHz)

1 Scope

The objective of this document is to specify the assessment methods to evaluate compliance of stationary and dynamic wireless power transfer (WPT) systems with electromagnetic human exposure guidelines (external electric and magnetic fields, specific absorption rate (SAR), internal electric fields or current density including contact currents). The frequency range of this document is from 1 kHz to 30 MHz.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 (all parts), *International Electrotechnical Vocabulary* (available at http://www.electropedia.org)

ISO/IEC Guide 98-1:2009, *Uncertainty of measurement – Part 1: Introduction to the expression of uncertainty in measurement*

ISO/IEC Guide 98-3:2008, *Uncertainty of measurement – Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*

IEC 61786-1:2013, *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 61786-2:2014, *Measurement of DC magnetic, AC magnetic and AC electric fields from 1 Hz to 100 kHz with regard to exposure of human beings – Part 2: Basic standard for measurements*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp