



# PUBLICLY AVAILABLE SPECIFICATION



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**Electric vehicle wireless power transfer (WPT) systems –  
Part 5: Interoperability and safety of dynamic wireless power transfer (D-WPT)  
for electric vehicles**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**ELECTRIC VEHICLE WIRELESS POWER TRANSFER (WPT) SYSTEMS –****Part 5: Interoperability and safety of dynamic wireless power transfer (D-WPT) for electric vehicles**

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IEC PAS 61980-5 has been prepared by IEC technical committee 69: Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks. It is a Publicly Available Specification.

The text of this Publicly Available Specification is based on the following documents:

Draft	Report on voting
69/975/DPAS	69/1011/RVDPAS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Publicly Available Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

This document is to be read in conjunction with IEC 61980-1:2020.

The clauses of the particular requirements in this document supplement or modify the corresponding clauses in IEC 61980-1:2020. Where the text indicates an "addition" to or a "replacement" of the relevant requirement, test specification or explanation of IEC 61980-1:2020, these changes are made to the relevant text of IEC 61980-1:2020, which then becomes part of the standard. Where no change is necessary, the words "Clause/Subclause xx of IEC 61980-1:2020 is applicable" are used. Additional items to those of IEC 61980-1:2020 are numbered starting 101. Annexes are lettered from A onwards.

A list of all parts in the IEC 61980 series, published under the general title *Electric vehicle wireless power transfer (WPT) systems*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

NOTE In accordance with ISO/IEC Directives, Part 1, IEC PASs are automatically withdrawn after 4 years.

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## INTRODUCTION

The IEC 61980 series is published in separate parts according to the following structure:

- IEC 61980-1 covers general requirements for electric road vehicle (EV) wireless power transfer (WPT) systems including general background and definitions (e.g. efficiency, electrical safety, EMC, EMF);
- IEC 61980-2 applies to magnetic field wireless power transfer (MF-WPT) for electric road vehicles and covers specific requirements for system activities and communication between the electric road vehicle side and the off-board side, including general background and definitions;
- IEC 61980-3 covers specific power transfer requirements for the off-board side of magnetic field wireless power transfer systems for electric road vehicles (e.g. efficiency, electrical safety, EMC, EMF);
- IEC PAS 61980-4<sup>1</sup> covers specific power transfer requirements for the off-board side of magnetic field high power wireless power transfer (H-WPT) systems for electric road vehicles (e.g. efficiency, electrical safety, EMC, EMF).
- IEC 61980-5 covers specific power transfer requirements for the off-board side of magnetic field dynamic wireless power transfer (MF-D-WPT) systems for electric road vehicles (e.g. efficiency, electrical safety, EMC, EMF). This document is IEC 61980-5 and is under development as a PAS.
- IEC 61980-6<sup>2</sup> applies to magnetic field dynamic wireless power transfer for electric road vehicles (EV) and covers specific requirements for system activities and communication between the electric road vehicle side and the off-board side, including general background and definitions.

Requirements for the on-board side of MF-WPT and MF-D-WPT for electric road vehicles are covered in ISO PAS 5474-6<sup>3</sup>.

This document is being published as a PAS for information about how dynamic charging systems can work, as evidenced by demonstration systems described in Annex A to Annex D.

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC CD PAS 61980-4:2024.

<sup>2</sup> Under development.

<sup>3</sup> Under preparation. Stage at the time of publication: ISO CD PAS 5474-6:2023.



## **ELECTRIC VEHICLE WIRELESS POWER TRANSFER (WPT) SYSTEMS –**

### **Part 5: Interoperability and safety of dynamic wireless power transfer (D-WPT) for electric vehicles**

#### **1 Scope**

This part of IEC 61980 applies to the off-board supply equipment for dynamic wireless power transfer via magnetic field (MF-D-WPT) to electric road vehicles in motion for purposes of supplying electric energy to the RESS (rechargeable energy storage system) and/or other on-board electrical systems.

The system operates at standard supply voltage ratings per IEC 60038 up to 1 000 V AC and up to 1 500 V DC from the supply network. The power transfer takes place primarily while the electric vehicle (EV) is in motion, but can continue to take place under certain conditions while the vehicle is not in motion.

Off-board supply equipment fulfilling the requirements in this document are intended to operate with EV devices fulfilling the requirements of ISO 5474-4<sup>4</sup> and ISO 5474-6.

The aspects covered in this document includes

- the characteristics and operating conditions,
- specific power transfer requirements for the off-board side of magnetic field dynamic wireless power transfer systems for electric road vehicles, and
- the general requirement of electrical safety and EMC for MF-D-WPT.

Examples of D-WPT systems are described in the informative Annex A to Annex D.

#### **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 60038, *IEC standard voltages*

IEC 61980-1, *Electric vehicle wireless power transfer (WPT) systems – Part 1: General requirements*

IEC 61980-3, *Electric vehicle wireless power transfer (WPT) systems – Part 3: Specific requirements for magnetic field wireless power transfer systems*

ITU-R Recommendation SM.2110.1:2019, *Guidance on frequency ranges for operation of non-beam wireless power transmission for electric vehicles*

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<sup>4</sup> Under preparation. Stage at the time of publication: ISO DIS 5474-4:2024.