Electric vehicle wireless power transfer (WPT) systems - Part 3: Specific requirements for magnetic field wireless power transfer systems

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 61980-3:2022 sisaldab Euroopa standardi EN IEC 61980-3:2022 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 61980-3:2022 consists of the English text of the European standard EN IEC 61980-3:2022.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation and Accreditation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 23.12.2022.	Date of Availability of the European standard is 23.12.2022.
Standard on kättesaadav Eesti Standardimis-ja Akrediteerimiskeskusest.	The standard is available from the Estonian Centre for Standardisation and Accreditation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 43.120

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 61980-3

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English Version

Electric vehicle wireless power transfer (WPT) systems - Part 3: Specific requirements for magnetic field wireless power transfer systems (IEC 61980-3:2022)

Systèmes de transfert de puissance sans fil (WPT) pour véhicules électriques - Partie 3: Exigences spécifiques pour les systèmes de transfert de puissance sans fil par champ magnétique (IEC 61980-3:2022)

Kontaktlose Energieübertragungssysteme (WPT) für Elektrofahrzeuge - Teil 3: Besondere Anforderungen für die kontaktlosen Energieübertragungssysteme mit Magnetfeld (IEC 61980-3:2022)

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European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 61980-3:2022 E

European foreword

The text of document 69/857/FDIS, future edition 1 of IEC 61980-3, prepared by IEC/TC 69 "Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61980-3:2022.

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) 2023-09-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2025-12-22

This document supersedes CLC IEC/TS 61980-3:2020 and all of its amendments and corrigenda (if any).

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Endorsement notice

The text of the International Standard IEC 61980-3:2022 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 standard indicated:

IEC 60038	NOTE	Harmonized as EN 60038
IEC 61786-1	NOTE	Harmonized as EN 61786-1
ISO 15118-1:2019	NOTE	Harmonized as EN ISO 15118-1:2019 (not modified)

IEC 61980-3

Edition 1.0 2022-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Electric vehicle wireless power transfer (WPT) systems – Part 3: Specific requirements for magnetic field wireless power transfer systems

Systèmes de transfert de puissance sans fil (WPT) pour véhicules électriques – Partie 3: Exigences spécifiques pour les systèmes de transfert de puissance sans fil par champ magnétique

IEC 61980-3:2022-11 (en-fr)

IEC Secretariat
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

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IEC 61980-3

Edition 1.0 2022-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

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Electric vehicle wireless power transfer (WPT) systems – Part 3: Specific requirements for magnetic field wireless power transfer systems

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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ELECTRIC VEHICLE WIRELESS POWER TRANSFER (WPT) SYSTEMS –

Part 3: Specific requirements for magnetic field wireless power transfer systems

FOREWORD

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IEC 61980-3 has been prepared by IEC technical committee 69: Electrical power/energy transfer systems for electrically propelled road vehicles and industrial trucks. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
69/857/FDIS	69/866/RVD

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 International Standard 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. The main document types developed by IEC are described in greater detail at www.iec.ch/standardsdev/publications.

In this document, the following print types are used:

- compliance statement: *italic type*.

This part is to be used 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 of 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 in the data related to the specific document. At this date, the document will be

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

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 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[1] specifically applies to magnetic field wireless power transfer (MF-WPT) 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;

– 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).

Requirements for the on-board side of MF-WPT for electric road vehicles are covered in ISO 19363.

IEC 61980-3 follows the structure of IEC 61980-1:2020.

[1] Under preparation. Stage at the time of publication: IEC/AFDIS 61980-2:2022.

ELECTRIC VEHICLE WIRELESS POWER TRANSFER (WPT) SYSTEMS –

Part 3: Specific requirements for magnetic field wireless power transfer systems

1 Scope

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

Off-board supply equipment fulfilling the requirements in this document are intended to operate with EV devices fulfilling the requirements described in ISO 19363.

The aspects covered in this document include

– the characteristics and operating conditions,
– the required level of electrical safety,
– requirements for basic communication for safety and process matters if required by a MF-WPT system,
– requirements for positioning to assure efficient and safe MF-WPT power transfer, and
– specific EMC requirements for MF-WPT systems.

The following aspects are under consideration for future documents:

– requirements for MF-WPT systems for two- and three-wheel vehicles,
– requirements for MF-WPT systems supplying power to EVs in motion,
– requirements for bidirectional power transfer,
– requirements for flush mounted primary device,
– requirements for MF-WPT systems for heavy duty vehicle, and
– requirements for MF-WPT systems with inputs greater than 11,1 kVA.

This document does not apply to

– safety aspects related to maintenance, and
– trolley buses, rail vehicles and vehicles designed primarily for use off-road.

NOTE The terms used in this document are specifically for MF-WPT.

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 60529, *Degrees of protection provided by enclosures (IP Code)*

IEC 61439-1:2020, *Low-voltage switchgear and controlgear assemblies – Part 1: General rules*

IEC 61439-7:2018, *Low-voltage switchgear and controlgear assemblies – Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations*

IEC 61980-1:2020, *Electric vehicle wireless power transfer (WPT) systems – Part 1: General requirements*

IEC 61980-2:—, *Electric vehicle wireless power transfer (WPT) systems – Part 2: Specific requirements for MF-WPT system communication and activities*[2]

ISO 19363:2020, *Electrically propelled road vehicles – Magnetic field wireless power transfer – Safety and interoperability requirements*

ISO 20653, *Road vehicles – Degrees of protection (IP code) – Protection of electrical equipment against foreign objects, water and access*

ICNIRP, *ICNIRP guidelines for limiting exposure to time-varying electric and magnetic fields (1 Hz – 100 kHz)*, Health Physics 99(6):818-836; 2010

Recommendation ITU-R SM.2110-1:2019, *Guidance on frequency ranges for operation of non-beam wireless power transmission for electric vehicles*

3 Terms and definitions

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

Clause 3 of IEC 61980-1:2020 is applicable.

Additional terms and definitions:

3.101
accessible part
part of equipment that can be touched without the use of a tool, excluding parts when under the vehicle

3.102
alignment
relative position in X- and Y- direction of the secondary device to the primary device for a given secondary device ground clearance

3.103
alignment tolerance area
intended WPT operating area in X- and Y- direction for a given secondary device ground clearance

[2] Under preparation. Stage at the time of publication: IEC/AFDIS 61980-2:2022.