ICS 27.070, 49.020 SLOVENSKÁ TECHNICKÁ NORMA Február 2024

| STN | **Technológia palivových článkov<br>Časť 4-202: Napájacie systémy na palivové články pre pohonné a pomocné napájacie jednotky<br>Bezpilotné lietadlá<br>Skúšobné metódy prevádzkových vlastností** | **STN<br>EN IEC<br>62282-4-202**<br><br>36 4512 |
|---|---|---|

Fuel cell technologies - Part 4-202: Fuel cell power systems for propulsion and auxiliary power units - Unmanned aircrafts - Performance test methods

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/24

Obsahuje: EN IEC 62282-4-202:2023, IEC 62282-4-202:2023

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN IEC 62282-4-202

December 2023

ICS 27.070; 49.020

English Version

# Fuel cell technologies - Part 4-202: Fuel cell power systems for propulsion and auxiliary power units - Unmanned aircrafts - Performance test methods (IEC 62282-4-202:2023)

Technologies des piles à combustibles - Partie 4-202: Systèmes à piles à combustible pour les groupes auxiliaires de puissance et de propulsion - Aéronefs sans pilote - Méthodes d'essai des performances (IEC 62282-4-202:2023)

Brennstoffzellentechnologien - Teil 4-202: Brennstoffzellen-Energiesysteme für Antriebs- und Hilfsaggregate - Unbemannte Luftfahrzeugsysteme - Leistungsprüfverfahren (IEC 62282-4-202:2023)

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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 62282-4-202:2023 E

# European foreword

The text of document 105/998/FDIS, future edition 1 of IEC 62282-4-202, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62282-4-202:2023.

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) 2024-08-21
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-11-21

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

## Endorsement notice

The text of the International Standard IEC 62282-4-202:2023 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 62282-3-200:2015 NOTE Approved as EN 62282-3-200:2016 (not modified)

IEC 62282-3-201:2017 NOTE Approved as EN 62282-3-201:2017 (not modified)

IEC 62282-4-102:2022 NOTE Approved as EN IEC 62282-4-102:2023 (not modified)

IEC 62282-6-200:2016 NOTE Approved as EN 62282-6-200:2017 (not modified)

# Annex ZA
(normative)

## Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

| Publication | Year | Title | EN/HD | Year |
|---|---|---|---|---|
| IEC 60050-485 | - | International Electrotechnical Vocabulary (IEV) - Part 485: Fuel cell technologies | - | - |
| IEC 60529 | - | Degrees of protection provided by enclosures (IP Code) | EN 60529 | - |

# IEC 62282-4-202

Edition 1.0 2023-10

# INTERNATIONAL STANDARD

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## Fuel cell technologies – Part 4-202: Fuel cell power systems for propulsion and auxiliary power units – Unmanned aircrafts – Performance test methods

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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# CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# FUEL CELL TECHNOLOGIES –

# Part 4-202: Fuel cell power systems for propulsion and auxiliary power units – Unmanned aircrafts – Performance test methods

## FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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IEC 62282-4-202 has been prepared by IEC technical committee 105: Fuel cell technologies. It is an International Standard.

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

| Draft | Report on voting |
|---|---|
| 105/998/FDIS | 105/1009/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/publications.

A list of all parts in the IEC 62282 series, published under the general title *Fuel cell technologies*, 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, or
- revised.

# INTRODUCTION

This part of IEC 62282-4 provides consistent and repeatable test methods for the electrical, thermal and environmental performance of fuel cell power systems for unmanned aircrafts.

The IEC 62282-4 series deals with the safety, performance, and interchangeability of fuel cell power systems for propulsion for categories of vehicles other than road vehicles and for auxiliary power units (APUs). Among the categories covered by the IEC 62282-4 series, this document focuses on fuel cell power systems for unmanned aircrafts because there is an urgent demand for such an application in the world.

This part of IEC 62282-4 describes type tests and their test methods only. No routine tests are required or identified, and no performance targets are set in this document.

The purpose of this document is to evaluate the fuel cell system in the various combinations of fuel cell and unmanned aircrafts. This document provides a framework for designing and evaluating a fuel cell system for use specifically in an unmanned aircraft.

This part of IEC 62282-4 can be used by manufacturers of fuel cell power systems used for unmanned aircrafts or those who evaluate the performance of their systems for certification purposes.

Users of this document selectively execute test items that are suitable for their purposes from those described in this document. This document is not intended to exclude any other methods.

# FUEL CELL TECHNOLOGIES –

# Part 4-202: Fuel cell power systems for propulsion and auxiliary power units – Unmanned aircrafts – Performance test methods

## 1 Scope

This part of IEC 62282 covers performance test methods of fuel cell power systems intended to be used to power unmanned aircrafts, including general requirements, start-up, shutdown, power output, continuous running time, electric efficiency, data transmission, warning and monitoring, environmental compatibility, etc.

The scope of this document is limited to electrically powered unmanned aircrafts with a maximum take-off mass not exceeding 150 kg (i.e. level 5 or lower unmanned aircrafts (UAs)).

This document applies to fuel cell power systems with a rated output voltage not exceeding 220 V DC for outdoor use.

This document applies only to compressed gaseous hydrogen-fuelled fuel cell power systems.

This document does not apply to reformer-equipped fuel cell power systems.

## 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 60050-485, *International Electrotechnical Vocabulary (IEV) – Part 485: Fuel cell technologies,* available at http://www.electropedia.org

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