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STN	**Technológia palivových článkov Časť 4-102: Výkonové sústavy palivových článkov na pohon elektrických priemyselných vozíkov Skúšobné metódy prevádzkových vlastností**	**STN EN IEC 62282-4-102** 36 4512

Fuel cell technologies - Part 4-102: Fuel cell power systems for electrically powered industrial trucks - 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. 03/23

Obsahuje: EN IEC 62282-4-102:2023, IEC 62282-4-102:2022

Oznámením tejto normy sa od 24.01.2026 ruší
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NORME EUROPÉENNE

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EN IEC 62282-4-102

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Supersedes EN 62282-4-102:2017

English Version

Fuel cell technologies - Part 4-102: Fuel cell power systems for electrically powered industrial trucks - Performance test methods (IEC 62282-4-102:2022)

Technologies des piles à combustible - Partie 4-102: Systèmes à piles à combustible pour chariots de manutention électriques - Méthodes d'essai des performances
(IEC 62282-4-102:2022)

Brennstoffzellentechnologien - Teil 4-102: Antriebe mit Brennstoffzellen-Energiesystemen für elektrisch angetriebene Flurförderzeuge - Leistungskennwerteprüfverfahren
(IEC 62282-4-102:2022)

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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

European foreword

The text of document 105/947/FDIS, future edition 2 of IEC 62282-4-102, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62282-4-102:2023.

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) 2023-10-24
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2026-01-24

This document supersedes EN 62282-4-102:2017 and all of its amendments and corrigenda (if any).

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 62282-4-102:2022 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 61672-1	NOTE Approved as EN 61672-1
IEC 62282-3-200:2015	NOTE Approved as EN 62282-3-200:2016 (not modified)
IEC 62282-3-201	NOTE Approved as EN 62282-3-201
IEC 62282-4-101:2022	NOTE Approved as EN IEC 62282-4-101:2022 (not modified)
ISO 5815 (series)	NOTE Approved as EN ISO 5815 (series)
ISO 6976	NOTE Approved as EN ISO 6976
ISO 9000	NOTE Approved as EN ISO 9000
ISO 9001	NOTE Approved as EN ISO 9001
ISO 9004	NOTE Approved as EN ISO 9004
ISO 10523	NOTE Approved as EN ISO 10523

Annex A
(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.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 62282-6-300	2012	Fuel cell technologies - Part 6-300: Micro fuel cell power systems - Fuel cartridge interchangeability	EN 62282-6-300	2013
ISO 6798-1	-	Reciprocating internal combustion engines - Measurement of sound power level using sound pressure - Part 1: Engineering method	-	-
ISO 6798-2	-	Reciprocating internal combustion engines - Measurement of sound power level using sound pressure - Part 2: Survey method	-	-
ISO 14687	-	Hydrogen fuel quality - Product specification	-	-

IEC 62282-4-102

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

Fuel cell technologies – Part 4-102: Fuel cell power systems for electrically powered industrial trucks – Performance test methods

Technologies des piles à combustible – Partie 4-102: Systèmes à piles à combustible pour chariots de manutention électriques – Méthodes d'essai des performances

IEC 62282-4-102:2022-12(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FUEL CELL TECHNOLOGIES –

Part 4-102: Fuel cell power systems for electrically powered industrial trucks – 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 62282-4-102 has been prepared by IEC technical committee 105: Fuel cell technologies. It is an International Standard.

This second edition cancels and replaces the first edition published in 2017. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) alignment of the Scope with the second edition of IEC 62282-4-101:2022;
b) deletion of terms and definitions (previous entries 3.5, 3.10, and 3.15);
c) addition of new terms in Clause 3: "delivered power" (3.13) and "regenerated power" (3.14);
d) revision of symbols and their meanings in alignment with those of IEC 62282-3-201;
e) replacement of "reference conditions" with "standard conditions" as seen in Clause 5;
f) revision of the test method for the accessory load voltage spike test (13.3.2);

g) addition of clarifications in Clause 14 (Power stability under operation);

h) addition of a checklist for performance criteria dealt with in this document (Annex C).

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

Draft	Report on voting
105/947/FDIS	105/954/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,
- replaced by a revised edition, or
- amended.

INTRODUCTION

This part of IEC 62282-4 provides consistent and repeatable test methods for the electric, thermal and environmental performance of fuel cell power systems for electrically powered industrial trucks.

The IEC 62282-4 series deals with categories such as safety, performance, and interchangeability of fuel cell power systems for propulsion other than road vehicles and auxiliary power units (APUs). This document (IEC 62282-4-102) focuses on performance test methods for fuel cell power systems used to drive industrial electric trucks, which are being manufactured and used increasingly worldwide. This is because such applications are urgently needed 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.

Fuel cell systems used in electrically powered industrial trucks, such as forklift trucks, use both batteries and fuel cells, and so operate in several different modes. Similarly, forklift trucks operate in different modes. The purpose of this document is to evaluate the fuel cell system in the various combinations of fuel cell modes and forklift truck modes. This document breaks down these different modes and provides a framework for designing and evaluating a fuel cell system for use specifically in a forklift truck.

This part of IEC 62282-4 is intended to be used by either manufacturers of fuel cell power systems used for electrically powered industrial trucks or those who evaluate the performance of the systems used in them for certification purposes or both.

Users of this document can select and perform the tests they need from those described. This document is not intended to exclude any other tests.

FUEL CELL TECHNOLOGIES –

Part 4-102: Fuel cell power systems for electrically powered industrial trucks – Performance test methods

1 Scope

This part of IEC 62282 specifies the performance test methods of fuel cell power systems for propulsion and auxiliary power units (APU). This document covers fuel cell power systems for propulsion other than those for road vehicles.

This document covers the performance test methods of fuel cell power systems intended to be used for electrically powered industrial trucks as defined in ISO 5053-1, except for:

– rough-terrain trucks;
– non-stacking low-lift straddle carrier;
– stacking high-lift straddle carrier;
– rough-terrain variable-reach truck;
– slewing rough-terrain variable-reach truck;
– variable-reach container handler;
– pedestrian propelled trucks.

This document applies to gaseous hydrogen-fuelled fuel cell power systems and direct methanol fuel cell power systems for electrically powered industrial trucks. The following fuels are considered within the scope of this document:

– gaseous hydrogen, and
– methanol.

This document covers the fuel cell power system as defined in 3.7 and Figure 1.

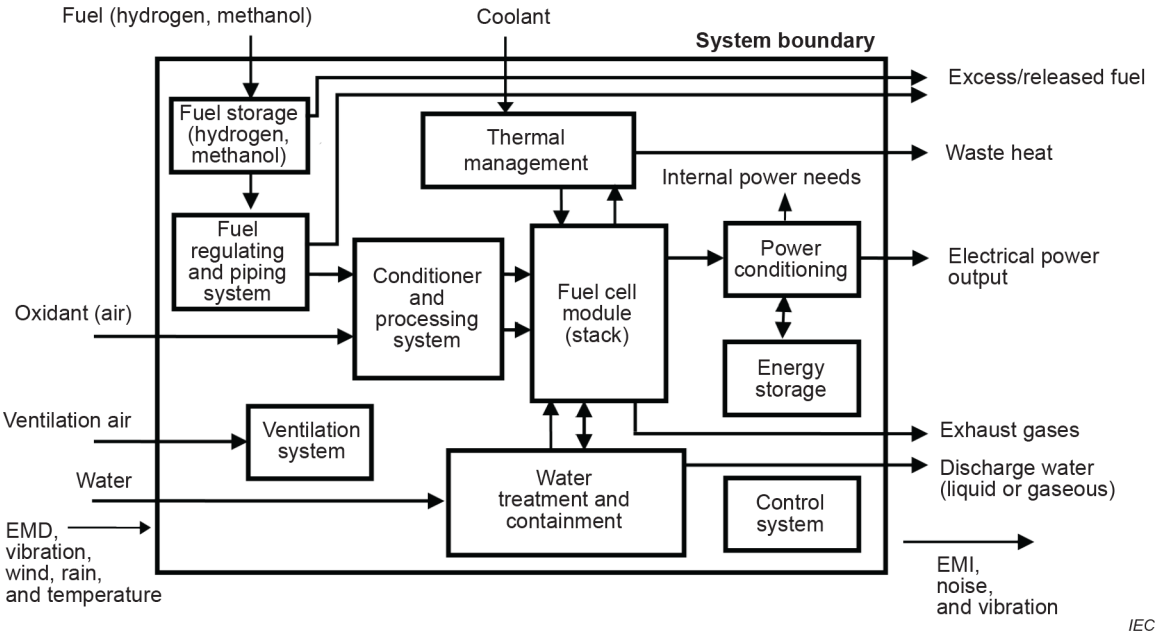
This document applies to DC type fuel cell power systems, with a rated output voltage not exceeding DC 150 V for indoor and outdoor use.

This document covers fuel cell power systems whose fuel source container is permanently attached to either the industrial truck or the fuel cell power system.

All systems with integrated energy storage systems are covered by this document. This includes systems such as batteries for internal recharges or recharged from an external source.

The following are not included in the scope of this document:

– detachable type fuel source containers;
– hybrid trucks that include an internal combustion engine;
– reformer-equipped fuel cell power systems;
– fuel cell power systems intended for operation in potentially explosive atmospheres;
– fuel storage systems using liquid hydrogen.



Key

EMD electromagnetic disturbance

EMI electromagnetic interference

NOTE A fuel cell power system can contain all or some of the above components.

Figure 1 – Fuel cell power systems for electrically powered industrial trucks

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 62282-6-300:2012, *Fuel cell technologies – Part 6-300: Micro fuel cell power systems – Fuel cartridge interchangeability*

ISO 6798-1, *Reciprocating internal combustion engines – Measurement of sound power level using sound pressure – Part 1: Engineering method*

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