

Fuel cell technologies - Part 2: Fuel cell modules

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ICS 27.070

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English version

**Fuel cell technologies -
Part 2: Fuel cell modules
(IEC 62282-2:2012)**

Technologies des piles à combustible -
Partie 2: Modules à piles à combustible
(CEI 62282-2:2012)

Brennstoffzellentechnologien -
Teil 2: Brennstoffzellenmodule
(IEC 62282-2:2012)

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

Foreword

The text of document 105/378/FDIS, future edition 2 of IEC 62282-2, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62282-2:2012.

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) 2013-02-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2015-04-30

This document supersedes EN 62282-2:2004 + A1:2007.

EN 62282-2:2012 includes the following significant technical changes with respect to EN 62282-2:2004:

- inclusion of definitions for hazards and hazardous locations based on the EN 60079 series;
- the general safety strategy is modified to reflect the needs for different application standards. The modifications are in line with similar modifications made to EN 62282-3-100;
- the electrical components clause is modified to reflect the needs for different application standards. The modifications are in line with similar modifications made to EN 62282-3-100;
- the marking and instructions have been enlarged to provide the system integrator with the necessary information.

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

Endorsement notice

The text of the International Standard IEC 62282-2:2012 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 standards indicated:

IEC 60812	NOTE	Harmonised as EN 60812.
IEC 61025	NOTE	Harmonised as EN 61025.
IEC 60079-20-1	NOTE	Harmonised as EN 60079-20-1.
IEC 62282-3-100	NOTE	Harmonised as EN 62282-3-100.
ISO 1307:2006	NOTE	Harmonised as EN ISO 1307:2006 (not modified).
ISO 1402:2009	NOTE	Harmonised as EN ISO 1402:2009 (not modified).

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60079	Series	Explosive atmospheres	EN 60079	Series
IEC 60079-10	Series	Explosive atmospheres - Part 10: Classification of areas	EN 60079-10	Series
IEC 60204-1	-	Safety of machinery - Electrical equipment of EN 60204-1 machines - Part 1: General requirements		-
IEC 60335-1	-	Household and similar electrical appliances - Safety - Part 1: General requirements	EN 60335-1	-
IEC 60352	Series	Solderless connections	EN 60352	Series
IEC 60512-15	Series	Connectors for electronic equipment - Tests and measurements - Part 15: Connector tests (mechanical)	EN 60512-15	Series
IEC 60512-16	Series	Connectors for electronic equipment - Tests and measurements - Part 16: Mechanical tests on contacts and terminations	EN 60512-16	Series
IEC 60529	-	Degrees of protection provided by enclosures (IP Code)	EN 60529	-
IEC 60617		Graphical symbols for diagrams	-	-
IEC 60695	Series	Fire hazard testing	EN 60695	Series
IEC 60730-1	-	Automatic electrical controls for household and similar use - Part 1: General requirements	EN 60730-1	-
IEC 60950-1	-	Information technology equipment - Safety - Part 1: General requirements	EN 60950-1	-
IEC 61508	Series	Functional safety of electrical/electronic/programmable electronic safety-related systems	EN 61508-1	Series
IEC 62040-1	-	Uninterruptible Power Systems (UPS) - Part 1: General and safety requirements for UPS	EN 62040-1	-
IEC 62061	-	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	-
ISO 13849-1	-	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	EN ISO 13849-1	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 23550	-	Safety and control devices for gas burners and gas-burning appliances - General requirements	-	-
		Electronic equipment for use in power installations	EN 50178	-

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INTRODUCTION

Fuel cell modules are electrochemical devices which convert continuously supplied fuel, such as hydrogen or hydrogen rich gases, alcohols, hydrocarbons and oxidants to d.c. power, heat, water and other by-products.

Fuel cell modules are sub-assemblies that are integrated into end-use products incorporating one or more fuel cell stacks and, if applicable, additional components.

FUEL CELL TECHNOLOGIES –

Part 2: Fuel cell modules

1 Scope

This part of IEC 62282 provides the minimum requirements for safety and performance of fuel cell modules and applies to fuel cell modules with the following electrolyte chemistry:

- alkaline;
- polymer electrolyte (including direct methanol fuel cells)¹;
- phosphoric acid;
- molten carbonate;
- solid oxide;
- aqueous solution of salts.

Fuel cell modules can be provided with or without an enclosure and can be operated at significant pressurization levels or close to ambient pressure.

This standard deals with conditions that can yield hazards to persons and cause damage outside the fuel cell modules. Protection against damage inside the fuel cell modules is not addressed in this standard, provided it does not lead to hazards outside the module.

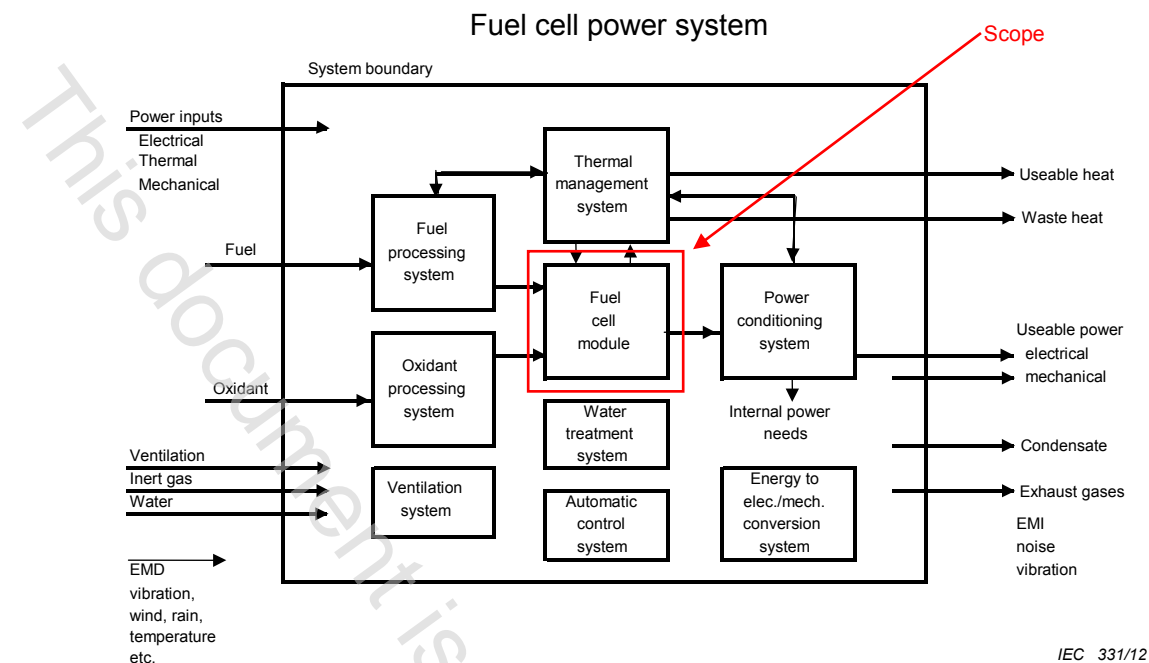
These requirements may be superseded by other standards for equipment containing fuel cell modules as required for particular applications.

This standard does not cover road vehicle applications.

This standard is not intended to limit or inhibit technological advancement. An appliance employing materials or having forms of construction differing from those detailed in the requirements of this standard may be examined and tested according to the purpose of these requirements and, if found to be substantially equivalent, may be considered to comply with this standard.

The fuel cell modules are components of final products. These products require evaluation to appropriate end-product safety requirements.

¹ Also known as proton exchange membrane fuel cell.



Key

EMD electromagnetic disturbance
EMI electromagnetic interference

Figure 1 – Fuel cell system components

This standard covers only up to the d.c. output of the fuel cell module.

This standard does not apply to peripheral devices as illustrated in Figure 1.

This standard does not cover the storage and delivery of fuel and oxidant to the fuel cell module.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079 (all parts), *Explosive atmospheres*

IEC 60079-10 (all Parts 10), *Explosive atmospheres – Part 10: Classification of areas*

IEC 60204-1, *Safety of machinery – Electrical equipment of machines – Part 1: General requirements*

IEC 60335-1, *Household and similar electrical appliances – Safety – Part 1: General requirements*

IEC 60352 (all parts), *Solderless connections*

IEC 60512-15 (all parts), *Connectors for electronic equipment – Tests and measurements – Part 15: Connector tests (mechanical)*

IEC 60512-16 (all parts) *Connectors for electronic equipment – Tests and measurements – Part 16: Mechanical tests on contacts and terminations*

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

IEC 60617, *Graphical symbols for diagrams*

IEC 60695 (all parts), *Fire hazard testing*

IEC 60730-1, *Automatic electrical controls for household and similar use – Part 1: General requirements*

IEC 60950-1, *Information technology equipment – Safety – Part 1: General requirements*

IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*

IEC 62040-1, *Uninterruptible power systems (UPS) – Part 1: General and safety requirements for UPS*

IEC 62061, *Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems*

ISO 13849-1, *Safety of machinery – Safety related parts of control systems – Part 1: General principles for design*

ISO 23550, *Safety and control devices for gas burners and gas-burning appliances – General requirements*

EN 50178, *Electronic equipment for use in power installations*

3 Terms and definitions

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

3.1

acceptance test

contractual test to prove to the customer that the item meets certain conditions of its specification

[SOURCE: IEC 60050-151:2001, 151-16-23] [1]²

3.2

allowable differential working pressure

maximum pressure difference between the anode and cathode side specified by the manufacturer which the fuel cell module can withstand without any damage or permanent loss of functional properties

² References in square brackets refer to the bibliography.