

Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety

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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 62282-3-100:2020 sisaldab Euroopa standardi EN IEC 62282-3-100:2020 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 62282-3-100:2020 consists of the English text of the European standard EN IEC 62282-3-100:2020.
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.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 10.04.2020.	Date of Availability of the European standard is 10.04.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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ICS 27.070

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EUROPEAN STANDARD

**EN IEC 62282-3-100**

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**Fuel cell technologies - Part 3-100: Stationary fuel cell power systems - Safety  
(IEC 62282-3-100:2019)**

Technologies des piles à combustible - Partie 3-100:  
Systèmes à piles à combustible stationnaires - Sécurité  
(IEC 62282-3-100:2019)

Brennstoffzellentechnologien - Teil 3-100: Stationäre  
Brennstoffzellen-Energiesysteme - Sicherheit  
(IEC 62282-3-100:2019)

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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 105/695/FDIS, future edition 2 of IEC 62282-3-100, prepared by IEC/TC 105 "Fuel cell technologies" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 62282-3-100:2020.

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) 2020-10-10
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-04-10

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The text of the International Standard IEC 62282-3-100:2019 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 60079-20-1	NOTE	Harmonized as EN 60079-20-1
IEC 60812	NOTE	Harmonized as EN IEC 60812
IEC 61025	NOTE	Harmonized as EN 61025

## 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.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60079-2	-	Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure "p"	2:EN 60079-2	-
IEC 60079-10-1	-	Explosive atmospheres -- Part 10-1: Classification of areas - Explosive gas atmospheres	10-1:EN 60079-10-1	-
IEC 60079-29-1 (mod)	-	Explosive atmospheres - Part 29-1: detectors - Performance requirements of detectors for flammable gases	GasEN 60079-29-1	-
IEC 60204-1 (mod)	-	Safety of machinery - Electrical equipment of machines - Part 1: General requirements	EN 60204-1	-
IEC 60335-1 (mod)	2010	Household and similar electrical appliances - Safety - Part 1: General requirements	EN 60335-1	2012
			+A11	2014
			+A12	2017
			+AC	2014
			+A14	2019
			+A13	2017
			+prA15	
			+prA17	
			+prA16	
IEC 60335-2-51	-			-
IEC 60529	-	Classification of degrees of protection provided by enclosures	HD 365 S3	-
IEC 60730-1 (mod)	-	Automatic electrical controls - Part 1: General requirements	1:EN 60730-1	-
			+prA	
IEC 60730-2-5 (mod)	-	Automatic electrical controls - Part 2-5: Particular requirements for automatic electrical burner control systems	2-5:EN 60730-2-5	-
IEC 60730-2-6	-	Automatic electrical controls - Part 2-6: Particular requirements for automatic electrical pressure sensing controls including mechanical requirements	2-6:EN 60730-2-6	-
IEC 60730-2-9	-	Automatic electrical controls - Part 2-9: Particular requirements for temperature sensing control	2-9:EN IEC 60730-2-9	-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60950-1 (mod)	-	Information technology equipment - Safety	EN 60950-1	-
		- Part 1: General requirements	+A12	2011
			+AC	2011
			+prA13	
			+A11	2009
			+AC	
IEC 61000-3-2	-		EN IEC 61000-3-2	-
IEC 61000-3-3	-	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current &le;16 A per phase and not subject to conditional connection	EN 61000-3-3	-
IEC 61000-3-11	-		EN IEC 61000-3-11	-
IEC 61000-6-1	-	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity standard for residential, commercial and light-industrial environments	EN IEC 61000-6-1	-
			+prA	
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN IEC 61000-6-2	-
			+prA	
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments	EN IEC 61000-6-2	-
			+prA	
IEC 61000-6-4	-		EN IEC 61000-6-4	-
IEC 61508	series	Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (see <a href="http://www.iec.ch/functionalsafety">Functional Safety and IEC 61508</a>)	EN 61508	series
IEC 61511-1	-	Functional safety - Safety instrumented systems for the process industry sector - Part 1: Framework, definitions, system, hardware and application programming requirements	EN 61511-1	-
IEC 62040-1-1	-		EN 62040-1-1	-
			+EN 62040-1-2004	
			1:2003/corrigendum	
			Aug. 2004	
IEC 62061	-	Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems	EN 62061	-
			+EN 62061:2005/corrigendum	2010
			Feb. 2010	
IEC 62368-1	-	Audio/video, information and communication technology equipment - Part 1: Safety requirements	EN IEC 62368-1	-
			+prAB	
ISO 3864-2	-	Graphical symbols - Safety colours and safety signs - Part 2: Design principles for product safety labels		-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
ISO 4413	-	Hydraulic fluid power_ - General rules and safety requirements for systems and their components	EN ISO 4413	-
ISO 4414	-	Pneumatic fluid power_ - General rules and safety requirements for systems and their components	EN ISO 4414	-
ISO 5388	-	Stationary air compressors - Safety rules and code of practice		-
ISO 10439	series		EN ISO 10439	series
ISO 10440-1	-		EN ISO 10440-1	-
ISO 10440-2	-	Petroleum and natural gas industries - Rotary-type positive-displacement compressors -- Part 2: Packaged air compressors (oil-free)	EN ISO 10440-2	-
ISO 10442	-	Petroleum, chemical and gas service industries - Packaged, integrally geared centrifugal air compressors	EN ISO 10442	-
ISO 12499	-	Industrial fans -- Mechanical safety of fans -- Guarding	EN ISO 12499	-
ISO 13631	-	Petroleum and natural gas industries - Packaged reciprocating gas compressors	EN ISO 13631	-
ISO 13707	-	Petroleum and natural gas industries_-- Reciprocating compressors		-
ISO 13709	-	Centrifugal pumps for petroleum, petrochemical and natural gas industries	EN ISO 13709	-
ISO 13849-1	-	Safety of machinery - Safety-related parts of control systems - Part 1: General principles for design	EN ISO 13849-1	-
ISO 13850	-	Safety of machinery - Emergency stop function - Principles for design	EN ISO 13850	-
ISO 14847	-	Rotary positive displacement pumps - Technical requirements	EN ISO 14847	-
ISO 15649	-	Petroleum and natural gas industries_-- Piping		-
ISO 16111	-	Transportable gas storage devices --- Hydrogen absorbed in reversible metal hydride		-
ISO 23550	-	Safety and control devices for gas burners and gas-burning appliances_- General requirements		-
ISO 23551-1	-	Safety and control devices for gas burners and gas-burning appliances_- Particular requirements_- Part_1: Automatic valves		-
ISO 23553-1	-		EN ISO 23553-1	-
ISO 26142	-	Hydrogen detection apparatus -- Stationary applications		-
IEC/TS 61000-3-4	-	Electromagnetic compatibility (EMC) - Part-3-4: Limits - Limitation of emission of harmonic currents in low-voltage power supply systems for equipment with rated current greater than 16 A		-
IEC/TS 61000-3-5	-	Electromagnetic compatibility (EMC) - Part-3-5: Limits - Limitation of voltage fluctuations and flicker in low-voltage power supply systems for equipment with rated current greater than 75 A		-

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC/IEEE 60079-30-- 1 (mod)		Explosive atmospheres - Part 30-1: Electrical resistance trace heating - General and testing requirements	EN 60079-30-1	-

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# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## FUEL CELL TECHNOLOGIES –

### Part 3-100: Stationary fuel cell power systems – Safety

#### FOREWORD

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International Standard IEC 62282-3-100 has been prepared by IEC technical committee 105: Fuel cell technologies.

This second edition cancels and replaces the first edition published in 2012. This edition constitutes a technical revision.

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

- a) recognition that fuel carrying components qualified to leakage standards (soundness) need not be considered as potential flammable leak sources;
- b) new Annex C for small power systems; and
- c) clarifications for numerous requirements and tests.

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

FDIS	Report on voting
105/695/FDIS	105/705/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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.

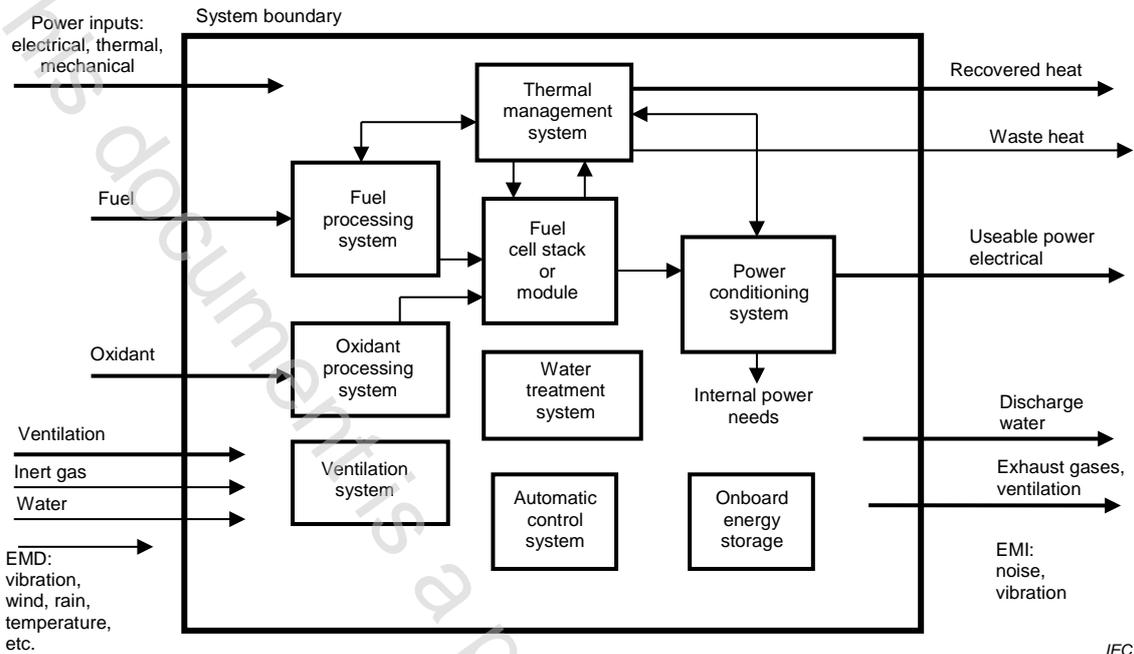
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- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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## INTRODUCTION

A typical stationary fuel cell power system is shown in Figure 1.



**Figure 1 – Typical stationary fuel cell power system**

The overall design of the power system anticipated by this document forms an assembly of integrated systems, as necessary, intended to perform designated functions, as follows.

- Fuel processing system – System of chemical and/or physical processing equipment plus associated heat exchangers and controls required to prepare, and if necessary, pressurize, the fuel for utilization within a fuel cell power system.
- Oxidant processing system – System that meters, conditions, processes and may pressurize the incoming supply for use within the fuel cell power system.
- Thermal management system – System that provides heating or cooling and heat rejection to maintain the fuel cell power system in the operating temperature range, and may provide for the recovery of excess heat and assist in heating the power train during start-up.
- Water treatment system – System that provides all the necessary purification treatment of the recovered or added water for use within the fuel cell power system.
- Power conditioning system – Equipment that is used to adapt the electrical energy produced by the fuel cell stack(s) to application requirements as specified by the manufacturer.
- Automatic control system – System(s) that is composed of sensors, actuators, valves, switches and logic components that maintain the fuel cell power system parameters within the manufacturer’s specified limits including moving to safe states without manual intervention.
- Ventilation system – System that provides air through mechanical or natural means to the fuel cell power system’s enclosure.
- Fuel cell modules – Equipment assembly of one or more fuel cell stacks which electrochemically converts chemical energy to electric energy and thermal energy intended to be integrated into a power generation system.

- Fuel cell stack – Equipment assembly of cells, separators, cooling plates, manifolds and a support structure that electrochemically converts, typically, hydrogen rich gas and air reactants to DC power, heat and other reactant bi-products.
- Onboard energy storage – System of internal electric energy storage devices intended to aid or complement the fuel cell module in providing power to internal or external loads.

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