IEC 62282-3-200

Edition 2.0 2015-11

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

## Fuel cell technologies – Part 3-200: Stationary fuel cell power systems - Performance test methods

## Technologies des piles à combustible – Partie 3-200: Systèmes à piles à combustible stationnaires – Méthodes d'essai des performances



IEC 62282-3-200:2015 (en-fr)

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# FUEL CELL TECHNOLOGIES –

# Part 3-200: Stationary fuel cell power systems – Performance test methods

## FOREWORD

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International Standard IEC 62282-3-200 has been prepared by IEC technical committee 105: Fuel cell technologies.

This second edition cancels and replaces the first edition of IEC 62282-3-200, published in 2011. This edition constitutes a technical revision.

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

a) a stabilization zone of ± 10 % for thermal output of 100 % response time is provided instead of the tests for thermal output of 90 % response time, while the tests for electric output of 90 % response time remain as an option;
b) the calculations for the ramp rate in kW/s are deleted and only the calculations for the response time (s) remain;

c) the procedures, criteria and figures of 9.3, Electric power and thermal power response characteristics test, are modified to ensure they produce accurate and consistent results;

d) maximum acceptable instantaneous electric power output transient is moved to informative Annex D.

IEC has published a related but independent standard IEC 62282-3-201 on performance test methods of small stationary fuel cell power systems which is harmonized with this standard.

The text of this standard is based on the following documents:

| FDIS | Report on voting |
|---|---|
| 105/547/FDIS | 105/555/RVD |

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

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

A list of all the 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 publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- withdrawn,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

# INTRODUCTION

This part of IEC 62282 describes how to measure the performance of stationary fuel cell power systems for residential, commercial, agricultural and industrial applications.

This standard describes type tests and their test methods only. In this standard, no routine tests are required or identified, and no performance targets are set.

The following fuel cell types have been considered:

– alkaline fuel cells (AFC);
– phosphoric acid fuel cells (PAFC);
– polymer electrolyte fuel cells (PEFC);
– molten carbonate fuel cells (MCFC);
– solid oxide fuel cells (SOFC).

# FUEL CELL TECHNOLOGIES –

# Part 3-200: Stationary fuel cell power systems – Performance test methods

## 1 Scope

This part of IEC 62282 covers operational and environmental aspects of the stationary fuel cell power systems performance. The test methods apply as follows:

– power output under specified operating and transient conditions;

– electrical and heat recovery efficiency under specified operating conditions;

– environmental characteristics; for example, exhaust gas emissions, noise, etc. under specified operating and transient conditions.

This standard does not provide coverage for electromagnetic compatibility (EMC).

This standard does not apply to small stationary fuel cell power systems with electric power output of less than 10 kW which are dealt with IEC 62282-3-201.

Fuel cell power systems may have different subsystems depending upon types of fuel cell and applications, and they have different streams of material and energy into and out of them. However, a common system diagram and boundary has been defined for evaluation of the fuel cell power system (see Figure 1).

The following conditions are considered in order to determine the system boundary of the fuel cell power system:

– all energy recovery systems are included within the system boundary;

– all kinds of electric energy storage devices are considered outside the system boundary;

– calculation of the heating value of the input fuel (such as natural gas, propane gas and pure hydrogen gas, etc.) is based on the conditions of the fuel at the boundary of the fuel cell power system.