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Part 3-201: Stationary fuel cell power systems – Performance test methods
for small fuel cell power systems**

**Technologies des piles à combustible –
Partie 3-201: Systèmes à piles à combustible stationnaires – Méthodes d'essai
des performances pour petits systèmes à piles à combustible**

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ISBN 978-2-8322-4632-0

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CONTENTS

FOREWORD.....	6
INTRODUCTION.....	8
1 Scope.....	9
2 Normative references	9
3 Terms and definitions	10
4 Symbols	15
5 Configuration of small stationary fuel cell power system	19
6 Reference conditions.....	20
7 Heating value base.....	20
8 Test preparation	21
8.1 General.....	21
8.2 Uncertainty analysis.....	21
8.3 Data acquisition plan	21
9 Test set-up.....	21
10 Instruments and measurement methods	23
10.1 General.....	23
10.2 Measurement instruments.....	24
10.3 Measurement points.....	24
10.4 Minimum required measurement systematic uncertainty.....	26
11 Test conditions	26
11.1 Laboratory conditions.....	26
11.2 Installation and operating conditions of the system	27
11.3 Power source conditions	27
11.4 Test fuel	27
12 Operating process	27
13 Test plan	29
14 Type tests on electric/thermal performance	30
14.1 General.....	30
14.2 Fuel consumption test.....	30
14.2.1 Gaseous fuel consumption test.....	30
14.2.2 Liquid fuel consumption test	33
14.3 Electric power output test.....	34
14.3.1 General	34
14.3.2 Test method	34
14.3.3 Calculation of average net electric power output.....	34
14.4 Heat recovery test.....	34
14.4.1 General	34
14.4.2 Test method	35
14.4.3 Calculation of average recovered thermal power	35
14.5 Start-up test.....	36
14.5.1 General	36
14.5.2 Determination of state of charge of the battery	36
14.5.3 Test method	37
14.5.4 Calculation of results	39

14.6	Ramp-up test	40
14.6.1	General	40
14.6.2	Test method	41
14.6.3	Calculation of results	41
14.7	Storage state test	42
14.7.1	General	42
14.7.2	Test method	42
14.7.3	Calculation of average electric power input in storage state	42
14.8	Electric power output change test	42
14.8.1	General	42
14.8.2	Test method	42
14.8.3	Calculation of electric power output change rate	44
14.9	Shutdown test	45
14.9.1	General	45
14.9.2	Test method	45
14.9.3	Calculation of results	46
14.10	Computation of efficiency	47
14.10.1	General	47
14.10.2	Electrical efficiency	47
14.10.3	Heat recovery efficiency	47
14.10.4	Overall energy efficiency	48
14.11	Rated operation cycle efficiency	48
14.11.1	General	48
14.11.2	Calculation of the operation cycle fuel energy input	48
14.11.3	Calculation of the operation cycle net electric energy output	49
14.11.4	Calculation of the operation cycle electrical efficiency	50
14.12	Electromagnetic compatibility (EMC) test	50
14.12.1	General requirement	50
14.12.2	Electrostatic discharge immunity test	51
14.12.3	Radiated, radio-frequency, electromagnetic field immunity test	51
14.12.4	Electrical fast transient/burst immunity test	51
14.12.5	Surge immunity test	51
14.12.6	Immunity test of conducted disturbances induced by radio-frequency fields	51
14.12.7	Power frequency magnetic field immunity test	51
14.12.8	Voltage dips and voltage interruptions	51
14.12.9	Radiated disturbance (emission) measurement test	52
14.12.10	Conducted disturbance (emission) measurement test	52
14.12.11	Power line harmonics emission measurement test	52
15	Type tests on environmental performance	52
15.1	General	52
15.2	Noise test	52
15.2.1	General	52
15.2.2	Test conditions	52
15.2.3	Test method	54
15.2.4	Processing of data	54
15.3	Exhaust gas test	54
15.3.1	General	54
15.3.2	Components to be measured	54

15.3.3	Test method	55
15.3.4	Processing of data	55
15.4	Discharge water test	65
15.4.1	General	65
15.4.2	Test method	65
16	Test reports	65
16.1	General.....	65
16.2	Title page.....	65
16.3	Table of contents	66
16.4	Summary report	66
Annex A (normative)	Heating values for components of natural gases	7
Annex B (informative)	Examples of composition for natural gases and propane gases.....	39
Annex C (informative)	Example of a test operation schedule	71
Annex D (informative)	Typical exhaust gas components.....	72
Annex E (informative)	Guidelines for the contents of detailed and full reports	73
E.1	General.....	73
E.2	Detailed report	73
E.3	Full report	73
Annex F (informative)	Selected duration of rated power operation	74
Bibliography	75
Figure 1	– Symbol diagram	17
Figure 2	– General configuration of small stationary fuel cell power system	20
Figure 3	– Test set-up for small stationary fuel cell power system fed with gaseous fuel which supplies electricity and useful heat	22
Figure 4	– Test set-up for small stationary fuel cell power system fed with gaseous fuel which supplies only electricity	23
Figure 5	– Operating states of stationary fuel cell power system without battery	28
Figure 6	– Operating states of stationary fuel cell power system with battery	29
Figure 7	– Example of electric power chart during start-up time for system without battery	37
Figure 8	– Example of electric power chart during start-up time for system with battery	38
Figure 9	– Example of liquid fuel supply systems	39
Figure 10	– Example of electric power chart during ramp-up for system without battery	41
Figure 11	– Electric power output change pattern for system without battery	43
Figure 12	– Electric power output change pattern for system with battery	44
Figure 13	– Example for electric power change stabilization criteria.....	44
Figure 14	– Electric power chart during shutdown time	46
Figure 15	– Noise measurement points for small stationary fuel cell power systems	53
Table 1	– Symbols and their meanings for electric/thermal performance	15
Table 2	– Additional symbols and their meanings for environmental performance	18
Table 3	– Compensation of readings against the effect of background noise.....	53
Table A.1	– Heating values for components of natural gases at various combustion reference conditions for ideal gas	67
Table B.1	– Example of composition for natural gas (%)	69

Table B.2 – Example of composition for propane gas (%) 70
Table C.1 – Example of a test operation schedule 71
Table D.1 – Typical exhaust gas components to be expected for typical fuels 72
Table F.1 – Selected duration of rated power operation 74

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FUEL CELL TECHNOLOGIES –

**Part 3-201: Stationary fuel cell power systems –
Performance test methods for small fuel cell power systems**

FOREWORD

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International Standard IEC 62282-3-201 has been prepared by IEC technical committee 105: Fuel cell technologies.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

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

- a) Revision of definitions
- b) Revision of symbols (Clause 4, in accordance with ISO/IEC 80000 series and ISO/IEC Directives Part 2);
- c) Revision of Figures 2, 5 and 6;
- d) Revision of test set-up (Clause 9);

- e) Revision of measurement instruments (Clause 10);
- f) Introduction of ramp-up test (14.6);
- g) Introduction of rated operation cycle efficiency (14.11);
- h) Introduction of electromagnetic compatibility (EMC) test (14.12);
- i) Revision of exhaust gas test (15.3);
- j) Introduction of typical durations of operation cycles (Annex F).

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

CDV	Report on voting
105/564/CDV	105/623/RVC

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.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "<http://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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colour which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This part of IEC 62282 provides consistent and repeatable test methods for the electrical, thermal and environmental performance of small stationary fuel cell power systems.

This document limits its scope to small stationary fuel cell power systems (electrical power output below 10 kW) and provides test methods specifically designed for them in detail. It is based on IEC 62282-3-200, which generally describes performance test methods that are common to all types of fuel cells.

This document is intended for manufacturers of small stationary fuel cell power systems and/or those who evaluate the performance of their systems for certification purposes.

Users of this document may 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 3-201: Stationary fuel cell power systems – Performance test methods for small fuel cell power systems

1 Scope

This part of IEC 62282 provides test methods for the electrical, thermal and environmental performance of small stationary fuel cell power systems that meet the following criteria:

- output: rated electric power output of less than 10 kW;
- output mode: grid-connected/independent operation or stand-alone operation with single-phase AC output or 3-phase AC output not exceeding 1 000 V, or DC output not exceeding 1 500 V;

NOTE The limit of 1 000 V for alternating current comes from the definition for "low voltage" given in IEC 60050-601:1985, 601-01-26.

- operating pressure: maximum allowable working pressure of less than 0,1 MPa (gauge) for the fuel and oxidant passages;
- fuel: gaseous fuel (natural gas, liquefied petroleum gas, propane, butane, hydrogen, etc.) or liquid fuel (kerosene, methanol, etc.);
- oxidant: air.

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

This document covers fuel cell power systems whose primary purpose is the production of electric power and whose secondary purpose may be the utilization of heat. Accordingly, fuel cell power systems for which the use of heat is primary and the use of electric power is secondary are outside the scope of this document.

All systems with integrated batteries are covered by this document. This includes systems where batteries are recharged internally or recharged from an external source.

This document does not cover additional auxiliary heat generators that produce thermal energy.

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.

CISPR 11, *Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement*

IEC 61000-3-2, *Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*

IEC 61000-4-2, *Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test*