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Standards

Irish Standard  
I.S. EN 62253:2011

# Photovoltaic pumping systems - Design qualification and performance measurements (IEC 62253:2011 (EQV))

## I.S. EN 62253:2011

*Incorporating amendments/corrigenda issued since publication:*

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<b>NSAI</b> 1 Swift Square, Northwood, Santry Dublin 9	T +353 1 807 3800 F +353 1 807 3838 E standards@nsai.ie  W NSAI.ie	<b>Sales:</b> T +353 1 857 6730 F +353 1 857 6729 W standards.ie
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
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**EN 62253**

September 2011

ICS 27.160

English version

**Photovoltaic pumping systems -  
Design qualification and performance measurements  
(IEC 62253:2011)**

Systèmes de pompage photovoltaïques -  
Qualification de la conception et mesures  
de performance  
(CEI 62253:2011)

Photovoltaische Pumpensysteme -  
Bauartegnug und Prüfung des  
Leistungsverhaltens  
(IEC 62253:2011)

This European Standard was approved by CENELEC on 2011-08-19. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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

**Management Centre: Avenue Marnix 17, B - 1000 Brussels**

## **I.S. EN 62253:2011**

EN 62253:2011

- 2 -

### **Foreword**

The text of document 82/647/FDIS, future edition 1 of IEC 62253, prepared by IEC TC 82, "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62253:2011.

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) 2012-05-19
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2014-08-19

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### **Endorsement notice**

The text of the International Standard IEC 62253:2011 was approved by CENELEC as a European Standard without any modification.

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 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 60068-2-6	-	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	-
IEC 60068-2-30	-	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)	EN 60068-2-30	-
IEC 60146	Series	Semiconductor converters - General requirements and line commutated converters	EN 60146	Series
IEC 60364-4-41	-	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock	HD 60364-4-41	-
IEC 60364-7-712	-	Electrical installations of buildings - Part 7-712: Requirements for special installations or locations - Solar photovoltaic (PV) power supply systems	HD 60364-7-712	-
IEC 60529	-	Degrees of protection provided by enclosures - (IP Code)		-
IEC 60947-1	-	Low-voltage switchgear and controlgear - Part 1: General rules	EN 60947-1	-
IEC 61000-6-2	-	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments	EN 61000-6-2	-
IEC 61000-6-3	-	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light- industrial environments	EN 61000-6-3	-
IEC 61215	-	Crystalline silicon terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61215	-
IEC 61646	-	Thin-film terrestrial photovoltaic (PV) modules - Design qualification and type approval	EN 61646	-
IEC 61683	1999	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency	EN 61683	2000
IEC 61725	-	Analytical expression for daily solar profiles	EN 61725	-
IEC 61730-1 (mod)	-	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction	EN 61730-1	-
IEC 61730-2 (mod)	-	Photovoltaic (PV) module safety qualification - Part 2: Requirements for construction	EN 61730-2	-

**I.S. EN 62253:2011**

EN 62253:2011

- 4 -

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61800-3	-	Adjustable speed electrical power drive systems - Part 3: EMC requirements and specific test methods	EN 61800-3	-
IEC 62103	-	Electronic equipment for use in power installations	-	-
IEC 62109-1	-	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements	EN 62109-1	-
IEC 62124	2004	Photovoltaic (PV) stand-alone systems - Design verification	EN 62124	2005
IEC 62305-3	-	Protection against lightning - Part 3: Physical damage to structures and life hazard	EN 62305-3	-
IEC 62458	-	Sound system equipment - Electroacoustic transducers - Measurement of large signal parameters	EN 62458	-
IEC 62548	201X <sup>1)</sup>	Design requirements for photovoltaic (PV) arrays	EN 62548	201X <sup>1)</sup>
ISO 9905	1994	Technical specifications for centrifugal pumps - Class I	EN ISO 9905	1997

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<sup>1)</sup> To be published.

## CONTENTS

FOREWORD.....	4
1 Scope and object.....	6
2 Normative references.....	6
3 Terms, definitions, system-types and -parameters.....	7
3.1 Terms and definitions .....	7
3.1.1 PV converter.....	7
3.1.2 PV pump aggregate .....	8
3.1.3 PV pump terminal cable .....	8
3.1.4 PV pump systems .....	8
3.1.5 Photovoltaic pumping systems in stand-alone operation .....	8
3.1.6 Impedance matching.....	8
3.2 System-types and -parameters .....	8
4 Requirements for system components.....	10
4.1 General .....	10
4.2 Relations to other standards .....	10
5 Performance measurement.....	11
5.1 General .....	11
5.2 Test set-up .....	11
5.3 Pumping system performance tests .....	13
5.3.1 General .....	13
5.3.2 P-Q characterisation .....	13
5.3.3 H-Q characterisation .....	15
5.3.4 Start-up power measurements .....	15
6 Design qualification for a pumping system.....	16
6.1 General .....	16
6.2 Customer data.....	16
6.3 System characteristics.....	17
6.4 Dimensioning of hydraulic equipment.....	18
6.5 Documentation .....	18
6.5.1 General .....	18
6.5.2 Operating and maintenance handbook for the pump maintenance staff at the PV pumping site.....	18
6.5.3 Maintenance handbook covering operation, repair and servicing.....	18
6.6 Design check of the PV pumping system in respect to the daily water volume.....	19
6.7 Recording of the measured parameters .....	19
Annex A (informative) Performance diagram, component characteristics and definitions .....	21
Figure 1 – Schematic of system types for the purposes of testing (In case C, $V_m$ and $I_m$ may be electronically commutated voltage and current) .....	9
Figure 2 – Example of PV pump test circuit in the lab .....	13
Figure 3 – Example of a P-Q diagram.....	14
Figure 4 – Example of an H-Q diagram for the same pump at different rotational speeds .....	15
Figure A.1 – System performance for a centrifugal pumping system.....	21
Table 1 – Categories of PV pumping systems for the purposes of testing.....	8

**I.S. EN 62253:2011**

62253 © IEC:2011

– 3 –

Table 2 – Definition of the parameters .....	10
Table 3 – Pressure in bars for equivalent heads of water .....	17
Table 4 – Core and optional parameters to be measured and recorded .....	20



## INTERNATIONAL ELECTROTECHNICAL COMMISSION

# PHOTOVOLTAIC PUMPING SYSTEMS – DESIGN QUALIFICATION AND PERFORMANCE MEASUREMENTS

## FOREWORD

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International Standard IEC 62253 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

FDIS	Report on voting
82/647/FDIS	82/656/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.

**I.S. EN 62253:2011**

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– 5 –

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site 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.

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## PHOTOVOLTAIC PUMPING SYSTEMS – DESIGN QUALIFICATION AND PERFORMANCE MEASUREMENTS

### 1 Scope and object

This International Standard defines the requirements for design, qualification and performance measurements of photovoltaic pumping systems in stand-alone operation. The outlined measurements are applicable for either indoor tests with PV generator simulator or outdoor tests using a real PV generator. This standard applies to systems with motor pump sets connected to the PV generator directly or via a converter (DC to DC or DC to AC). It does not apply to systems with electrical storage unless this storage is only used for the pump start up (< 100 Wh).

The goal is to establish a PV pumping system design verification procedure according to the specific environmental conditions. This Standard addresses the following pumping system design features:

- Power vs. flow rate characteristics at constant pumping head
- Pumping head vs. flow rate characteristics at constant speed
- System design parameters and requirements
- System specification
- Documentation requirements
- System design verification procedure

The object of this standard is to establish requirements in order to be able to verify the system performance characteristics of the PV pumping system. For this purpose the test set-up is outlined, the measurements and deviations to be taken are defined and a checklist for the data mining is established.

### 2 Normative references

The following referenced documents are indispensable for the application 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 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-30, *Environmental testing – Part 2:30: Tests – Test Db: Damp heat, cyclic (12 + 12 h cycle)*

IEC 60146 (all parts), *Semiconductor converters – General requirements and line commutated converters*

IEC 60364-4-41, *Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60364-7-712, *Electrical installations of buildings – Part 7-712: Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems*

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