

STN	Skúšanie a energetické hodnotenie fotovoltických (PV) modulov Časť 3: Energetické hodnotenie PV modulov	STN EN IEC 61853-3 36 4635
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Photovoltaic (PV) module performance testing and energy rating - Part 3: Energy rating of PV modules

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/19

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EUROPEAN STANDARD

EN IEC 61853-3

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October 2018

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English Version

**Photovoltaic (PV) module performance testing and energy rating
- Part 3: Energy rating of PV modules
(IEC 61853-3:2018)**

Essais de performance et caractéristiques assignées
d'énergie des modules photovoltaïques (PV) - Partie 3:
Caractéristiques assignées d'énergie des modules PV
(IEC 61853-3:2018)

Prüfung des Leistungsverhaltens von photovoltaischen
(PV)-Modulen und Energiebemessung - Teil 3:
Energiebemessung von PV-Modulen
(IEC 61853-3:2018)

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 61853-3:2018 (E)**European foreword**

The text of document 82/1441/FDIS, future edition 1 of IEC 61853-3, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61853-3:2018.

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) 2019-07-04
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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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60891	-	Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics	EN 60891	-
IEC 60904-3	-	Photovoltaic devices - Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data	EN 60904-3	-
IEC 60904-7	-	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices	EN 60904-7	-
IEC 60904-8	-	Photovoltaic devices - Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device	EN 60904-8	-
IEC 60904-8-1	-	Photovoltaic devices - Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices	EN 60904-8-1	-
IEC 61853-1	-	Photovoltaic (PV) module performance testing and energy rating - Part 1: Irradiance and temperature performance measurements and power rating	EN 61853-1	-
IEC 61853-2	-	Photovoltaic (PV) module performance testing and energy rating - Part 2: Spectral responsivity, incidence angle and module operating temperature measurements	EN 61853-2	-
IEC 61853-4	-	Photovoltaic (PV) module performance testing and energy rating - Part 4: Standard reference climatic profiles	-	-
IEC/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	-	-



IEC 61853-3

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Photovoltaic (PV) module performance testing and energy rating –
Part 3: Energy rating of PV modules**

**Essais de performance et caractéristiques assignées d'énergie des modules
photovoltaïques (PV) –
Partie 3: Caractéristiques assignées d'énergie des modules PV**



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INTERNATIONAL STANDARD

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Part 3: Energy rating of PV modules**

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Partie 3: Caractéristiques assignées d'énergie des modules PV**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PHOTOVOLTAIC (PV) MODULE PERFORMANCE
TESTING AND ENERGY RATING –**
Part 3: Energy rating of PV modules**FOREWORD**

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International Standard IEC 61853-3 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

FDIS	Report on voting
82/1441/FDIS	82/1451/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 61853, published under the general title *Photovoltaic (PV) module performance testing and energy rating*, 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.

INTRODUCTION

This International Standard series establishes IEC requirements for determining PV module performance in terms of power (watts), specific module energy rating (kWh/kW) and climatic specific energy rating (dimensionless). It is written to be applicable to all PV technologies including non-linear devices. The methodology does not take into account either progressive degradation or transient behaviour such as light induced changes and/or thermal annealing.

This series consists of four parts:

- IEC 61853-1: *Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating*, which describes requirements for evaluating PV module performance in terms of power (watts) rating over a range of irradiances and temperatures;
- IEC 61853-2: *Photovoltaic (PV) module performance testing and energy rating – Part 2: Spectral responsivity, incidence angle, and module operating temperature measurements*, which describes test procedures for measuring the effect of varying angles of incidence and sunlight spectra as well as the estimation of module temperature from irradiance, ambient temperature, and wind speed;
- IEC 61853-3: *Photovoltaic (PV) module performance testing and energy rating – Part 3: Energy rating of PV modules*, which describes the calculations for PV module ratings; and
- IEC 61853-4: *Photovoltaic (PV) module performance testing and energy rating – Part 4: Standard reference climatic profiles*, which describes the standard time periods and environmental data set that shall be used for the energy rating calculations.

PHOTOVOLTAIC (PV) MODULE PERFORMANCE TESTING AND ENERGY RATING –

Part 3: Energy rating of PV modules

1 Scope

This part of IEC 61853 describes the calculation of PV module energy rating values. IEC 61853-1 describes requirements for evaluating PV module performance at various temperatures and irradiances in terms of power (watts) rating. IEC 61853-2 describes test procedures for determining module temperature from irradiance, ambient temperature and wind speed, a method for measuring angle of incidence effects, and spectral responsivity. IEC 61853-4 describes the standard reference climatic profiles (standard environmental data sets) that are used for calculating energy rating values.

The purpose of this document is to define a methodology to determine the PV module energy output (watt-hours), and the climatic specific energy rating (dimensionless) for a complete year at maximum power operation for the reference climatic profile(s) given in IEC 61853-4. It is applied to determine a specific module output in a standard reference climatic profile for the purposes of comparison of rated modules.

The methodology does not take into account either progressive degradation or transient behaviour such as light induced changes and/or thermal annealing.

The present document applies to mono-facial modules.

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.

IEC 60891, *Photovoltaic devices – Procedures for temperature and irradiance corrections to measured I-V characteristics*

IEC 60904-3, *Photovoltaic devices – Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data*

IEC 60904-7, *Photovoltaic devices – Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-8, *Photovoltaic devices – Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device*

IEC 60904-8-1, *Photovoltaic devices – Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices*

IEC TS 61836, *Solar photovoltaic energy systems – Terms, definitions and symbols*

IEC 61853-1, *Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating*

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IEC 61853-2, *Photovoltaic (PV) module performance testing and energy rating – Part 2: Spectral responsivity, incidence angle and module operating temperature measurements*

IEC 61853-4, *Photovoltaic (PV) module performance testing and energy rating – Part 4: Standard reference climatic profiles*

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