SVENSK STANDARD SS-EN 61829

Fastställd	Utgåva	Sida	Ansvarig kommitté
2016-05-11	2	1 (1+19)	SEK TK 82

Solceller –
Grupper av solcellsmoduler –
Fältmätning av förhållandet mellan ström och spänning

Photovoltaic (PV) array –
On-site measurement of current-voltage characteristics

Som svensk standard gäller europastandarden EN 61829:2016. Den svenska standarden innehåller den officiella engelska språkversionen av EN 61829:2016.

Nationellt förord

Europastandarden EN 61829:2016

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 61829, Second edition, 2015 - Photovoltaic (PV) array - On-site measurement of current-voltage characteristics**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61829, utgåva 1, 1999, gäller ej fr o m 2019-02-26.

ICS 27.160.00

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61829

February 2016

ICS 27.160

Supersedes EN 61829:1998

English Version

Photovoltaic (PV) array - On-site measurement of current-voltage characteristics (IEC 61829:2015)

Champ de modules photovoltaïques (PV) - Mesurage sur site des caractéristiques courant-tension (IEC 61829:2015)

Photovoltaische (PV) Modulgruppen - Messen der Strom-/Spannungskennlinien am Einsatzort (IEC 61829:2015)

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 61829:2016 E

SEK Svensk Elstandard

European foreword

The text of document 82/1008/FDIS, future edition 2 of IEC 61829, prepared by IEC/TC 82 “Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 61829:2016.

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)	2016-08-26
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2019-02-26

This document supersedes EN 61829:1998.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC [and/or CEN] shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 61829:2015 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 60904-5	NOTE	Harmonized as EN 60904-5.
IEC 61853-1:2011	NOTE	Harmonized as EN 61853-1:2011 (not modified).
ISO/IEC 17025	NOTE	Harmonized as EN ISO/IEC 17025.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 When 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

Publication	Year	Title	EN/HD	Year
IEC 60891	-	Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics	EN 60891	-
IEC 60904-1	-	Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics	EN 60904-1	-
IEC 60904-2	-	Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices	EN 60904-2	-
IEC 60904-3	-	Photovoltaic devices - Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data	EN 60904-3	-
IEC 60904-4	-	Photovoltaic devices - Part 4: Reference solar devices - Procedures for establishing calibration traceability	EN 60904-4	-
IEC 60904-7	-	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices	EN 60904-7	-
IEC 60904-10	-	Photovoltaic devices - Part 10: Methods of linearity measurement	EN 60904-10	-

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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PHOTOVOLTAIC (PV) ARRAY – ON-SITE MEASUREMENT OF CURRENT-VOLTAGE CHARACTERISTICS

FOREWORD

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International Standard IEC 61829 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition published in 1995. This edition constitutes a technical revision.

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

a) it addresses many outdated procedures;
b) it accommodates commonly used commercial I-V curve tracers;
c) it provides a more practical approach for addressing field uncertainties;
d) it removes and replaces procedures with references to other updated and pertinent standards, including the IEC 60904 series, and IEC 60891.

The result is a much more practical and useful standard.

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

FDIS	Report on voting
82/1008/FDIS	82/1041/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.

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

The performance of photovoltaic (PV) systems over their decades-long life time is determined by comparing measured power production with the expected production as estimated from recorded weather conditions. Continuous measurements of system- or subsystem-level operating output can detect underperforming arrays but are not well suited for tracking degradation with any accuracy, or for identifying the weaknesses or failure modes that may exist within the array. Field I-V curve measurements offer a practical method of *in situ* benchmarking or troubleshooting for modules, strings and arrays. This International Standard specifies methods and approaches for field I-V curve measurements and calculations, and includes guidance for addressing the uncertainties associated with measurement devices and array configurations. Consistent and proper application of I-V curve measurement procedures helps to ensure that a PV system's performance is adequately characterized over time.

PHOTOVOLTAIC (PV) ARRAY – ON-SITE MEASUREMENT OF CURRENT-VOLTAGE CHARACTERISTICS

1 Scope

This International Standard specifies procedures for on-site measurement of flat-plate photovoltaic (PV) array characteristics, the accompanying meteorological conditions, and use of these for translating to standard test conditions (STC) or other selected conditions.

Measurements of PV array current-voltage (*I-V*) characteristics under actual on-site conditions and their translation to reference test conditions (RTC) can provide:

- data for power rating or capacity testing;
- verification of installed array power performance relative to design specifications;
- detection of possible differences between on-site module characteristics and laboratory or factory measurements;
- detection of possible performance degradation of modules and arrays with respect to on-site initial data;
- detection of possible module or array failures or poor performance.

For a particular module, on-site measurements translated to STC can be directly compared with results previously obtained in a laboratory or factory for that module. Corrections for differences in the spectral or spatial response of the reference devices may need to be assessed as specified in IEC 60904.

On-site array measurements are affected by diode, cable, and mismatch losses, soiling and shading, degradation due to aging, and other uncontrolled effects. Therefore, they are not expected to be equal to the product of the number of modules and the respective module data.

If a PV array is formed with sub-arrays of different tilt, orientation, technology, or electrical configuration, the procedure specified in this International Standard is applied to each unique PV sub-array of interest.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 60904-1, *Photovoltaic devices – Part 1: Measurement of photovoltaic current-voltage characteristics*

IEC 60904-2, *Photovoltaic devices – Part 2: Requirements for photovoltaic reference devices*

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

IEC 60904-4, *Photovoltaic devices – Part 4: Reference solar devices – Procedures for establishing calibration traceability*

IEC60904-7, *Photovoltaic devices – Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices*

IEC 60904-10, *Photovoltaic devices – Part 10: Methods for linearity measurements*