



BSI Standards Publication

## Photovoltaic (PV) systems – Requirements for testing, documentation and maintenance

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Part 1: Grid connected systems – Documentation, commissioning tests and inspection

This is a preview of "BS EN 62446-1:2016+A...". [Click here to purchase the full version from the ANSI store.](#)

## National foreword

This British Standard is the UK implementation of EN 62446-1:2016+A1:2018. It is identical to IEC 62446-1:2016, incorporating amendment 1:2018. It supersedes BS EN 62446-1:2016, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment A1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee GEL/82, Photovoltaic Energy Systems.

A list of organizations represented on this committee can be obtained on request to its secretary.

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English Version

**Photovoltaic (PV) systems – Requirements for testing,  
documentation and maintenance – Part 1: Grid connected  
systems – Documentation, commissioning tests and  
inspection (IEC 62446-1:2016)**

Systèmes photovoltaïques (PV) – Exigences pour  
les essais, la documentation et la maintenance –  
Partie 1: Systèmes connectés au réseau  
électrique – Documentation, essais de mise  
en service et examen (IEC 62446-1:2016)

Photovoltaik (PV) Systeme – Anforderungen an  
Prüfung, Dokumentation und Instandhaltung –  
Teil 1: Netzgekoppelte Systeme –  
Dokumentation, Inbetriebnahmeprüfung und  
Prüfanforderungen (IEC 62446-1:2016)

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## European foreword

The text of document 82/1036/FDIS, future edition 1 of IEC 62446-1, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62446-1:2016.

The following dates are fixed:

- latest date by which the document has to be implemented at (dop) 2016-11-23  
national level by publication of an identical national standard or  
by endorsement
- latest date by which the national standards conflicting with the (dow) 2019-02-23  
document have to be withdrawn

This document supersedes EN 62446:2009.

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The text of the International Standard IEC 62446-1:2016 was approved by CENELEC as a European Standard without any modification.

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## Foreword to amendment A1

The text of document 82/1415/FDIS, future IEC 62446-1:2016/A1, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62446-1:2016/A1:2018.

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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](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60364-6	—	Low voltage electrical installations — Part 6:Verification	HD 60364-6	—
IEC 60891	2009	Photovoltaic devices — Procedures for temperature and irradiance corrections to measured I-V characteristics	EN 60891	2010
IEC 61010	series	Safety requirements for electrical equipment for measurement, control, and laboratory use	EN 61010	series
IEC 61557	series	Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. — Equipment for testing, measuring or monitoring of protective measures	EN 61557	series
IEC 61730	series	Photovoltaic (PV) module safety qualification	EN IEC 61730	series
IEC 62548	2016	Photovoltaic (PV) arrays — Design-requirements		—

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## FOREWORD

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International Standard IEC 62446-1 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This first edition cancels and replaces IEC 62446 published in 2009. This edition constitutes a technical revision.

This edition includes the following significant technical change with respect to IEC 62446:2009 :

- the scope has been expanded to include a wider range of system test and inspection regimes to encompass larger and more complex PV systems.

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

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FDIS	Report on voting
82/1036/FDIS	82/1056A/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 parts in the IEC 62446 series, published under the general title *Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance*, 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.

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## INTRODUCTION

Grid connected PV systems are expected to have a lifetime of decades, with maintenance or modifications likely at some point over this period. Building or electrical works in the vicinity of the PV array are very likely, for example roof works adjacent to the array or modifications (structural or electrical) to a home that has a PV system. The ownership of a system may also change over time, particularly for systems mounted on buildings. Only by the provision of adequate documentation at the outset can the long term performance and safety of the PV system and works, on or adjacent to the PV system, be ensured.

This part of IEC 62446 is split into two sections:

- **System documentation requirements** – This section details the information that shall be provided within the documentation provided to the customer following installation of a grid connected PV system.
- **Verification** – This section provides the information expected to be provided following initial (or periodic) verification of an installed system. It includes requirements for inspection and testing.

This part of IEC 62446 references IEC TS 62548:2013, which is in the process of being converted into an International Standard. It is envisaged that work on the second edition of IEC 62446-1 will start when IEC 62548 is completed.

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# Photovoltaic (PV) systems – Requirements for testing, documentation and maintenance —

## Part 1: Grid connected systems – Documentation, commissioning tests and inspection

### 1 Scope

This part of IEC 62446 defines the information and documentation required to be handed over to a customer following the installation of a grid connected PV system. It also describes the commissioning tests, inspection criteria and documentation expected to verify the safe installation and correct operation of the system. It can also be used for periodic retesting.

This part of IEC 62446 is written for grid connected PV systems that do not utilize energy storage (e.g. batteries) or hybrid systems.

This part of IEC 62446 is for use by system designers and installers of grid connected solar PV systems as a template to provide effective documentation to a customer. By detailing the expected commissioning tests and inspection criteria, it is also intended to assist in the verification/inspection of a grid connected PV system after installation and for subsequent re-inspection, maintenance or modifications.

This part of IEC 62446 defines the different test regimes expected for different solar PV system types to ensure that the test regime applied is appropriate to the scale, type and complexity of the system in question.

NOTE This part of IEC 62446 does not address CPV (concentrating PV) systems, however many of the parts may apply.

### 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 60364-6, *Low-voltage electrical installations — Part 6: Verification*

☞ IEC 62548:2016 ☞, *Photovoltaic (PV) arrays — Design requirements*

☞ NOTE In some countries IEC 60364-7-712 is preferred over IEC 62548. Both standards are expected to provide similar results. ☞

IEC 61730 (all parts), *Photovoltaic (PV) module safety qualification*

IEC 61557 (all parts), *Electrical safety in low voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c. — Equipment for testing, measuring or monitoring of protective measures*

IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control, and laboratory use*

☞ IEC 60891:2009, *Photovoltaic devices — Procedures for temperature and irradiance corrections to measured I-V characteristics* ☞