SVENSK STANDARD SS-EN 62116

Fastställd	Utgåva	Sida	Ansvarig kommitté
2014-12-18	2	1 (1+28)	SEK TK 82

Solcellsanläggningar – Provning av anordningar för förhindrande av ödrift

Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures

Som svensk standard gäller europastandarden EN 62116:2014. Den svenska standarden innehåller den officiella engelska språkversionen av EN 62116:2014.

Nationellt förord

Europastandarden EN 62116:2014

består av:

– **europastandardens ikraftsättningsdokument,** utarbetat inom CENELEC
– **IEC 62116, Second edition, 2014 - Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 62116, utgåva 1, 2011, gäller ej fr o m 2017-04-02.

ICS 27.160.00

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Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

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Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62116

July 2014

ICS 27.160

Supersedes EN 62116:2011

English Version

Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures (IEC 62116:2014)

Onduleurs photovoltaïques interconnectés au réseau public - Procédure d'essai des mesures de prévention contre l'îlotage (CEI 62116:2014)

Photovoltaik-Wechselrichter für den Anschluss an das Stromversorgungsnetz - Prüfverfahren für Maßnahmen zur Verhinderung der Inselbildung (IEC 62116:2014)

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 62116:2014 E

SEK Svensk Elstandard

Foreword

The text of document 82/813/FDIS, future edition 2 of IEC 62116, prepared by IEC/TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62116:2014.

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) 2015-01-25

– latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2017-04-02

This document supersedes EN 62116:2011.

EN 62116:2014 includes the following significant technical changes with respect to EN 62116:2011:

<table>
<tr><th></th><th>Previous edition</th><th>Present edition</th></tr>
<tr><td>3.7</td><td rowspan="11">Real power</td><td rowspan="11">Active power</td></tr>
<tr><td>5.1</td></tr>
<tr><td>5.4</td></tr>
<tr><td>6.1 b)</td></tr>
<tr><td>6.1 d)</td></tr>
<tr><td>6.1 e)</td></tr>
<tr><td>6.1 g)</td></tr>
<tr><td>Table 1</td></tr>
<tr><td>Table 6</td></tr>
<tr><td>Table 7</td></tr>
<tr><td>Table 9</td></tr>
<tr><td>5.2</td><td>A PV array or PV array simulator (preferred) may be used.
If the EUT can operate in utility-interconnected mode from a storage battery, a DC power source may be used in lieu of a battery as long as the DC power source is not the limiting device as far as the maximum EUT input current is concerned.</td><td>A DC power source, such as a PV array simulator, a PV array, or a current and voltage limited DC power supply with series resistance may be used.
If the EUT can operate in utility-interconnected mode from a storage battery, a DC power source may be used in lieu of a battery as long as the DC power source shall not be the limiting device as far as the maximum EUT input current is concerned.</td></tr>
</table>

Table 5	EUT input voltage 90 %	EUT input voltage 75 %
	EUT input voltage 10 %	EUT input voltage 20 %
	EUT Trip Settings Manufacturer specified voltage and frequency trip settings	Voltage and frequency trip settings according to National standards and/or local code
Tables 6 & 7 (Heading)	Percent change in real load, reactive load from nominal	Percent change in active load, reactive load from nominal output power

Major changes with respect to the previous edition concern the DC power source and test conditions.

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 62116:2014 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 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/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	CLC/TS 61836	-

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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UTILITY-INTERCONNECTED PHOTOVOLTAIC INVERTERS – TEST PROCEDURE OF ISLANDING PREVENTION MEASURES

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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International Standard IEC 62116 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition issued in 2008 and constitutes a technical revision.

The main technical changes with regard to the previous edition are as follows:

	Previous edition	Present edition
Clause 3.7 5.1 5.4 6.1 b) 6.1 d) 6.1 e) 6.1 g) Table 1 Table 6 Table 7 Table 9	Real power	Active power
5.2	A PV array or PV array simulator (preferred) may be used. If the EUT can operate in utility-interconnected mode from a storage battery, a DC power source may be used in lieu of a battery as long as the DC power source is not the limiting device as far as the maximum EUT input current is concerned.	A DC power source, such as a PV array simulator, a PV array, or a current and voltage limited DC power supply with series resistance may be used. If the EUT can operate in utility-interconnected mode from a storage battery, a DC power source may be used in lieu of a battery as long as the DC power source shall not be the limiting device as far as the maximum EUT input current is concerned.
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The text of this standard is based on the following documents:

FDIS	Report on voting
82/813/FDIS	82/827/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 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.

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

INTRODUCTION

Islanding is a condition in which a portion of an electric power grid, containing both load and generation, is isolated from the remainder of the electric power grid. This situation is one which electric power providers (utilities) regularly contend with. When an island is created purposely by the controlling utility – to isolate large sections of the utility grid, for example – it is called an intentional island. Conversely, an unintentional island can be created when a segment of the utility grid containing only customer-owned generation and load is isolated from the utility control.

Normally, the customer-owned generation is required to sense the absence of utility-controlled generation and cease energizing the grid. However, when the generation and load within the segment are well balanced prior to the isolation event, the utility is providing little power to the grid segment, thus making it difficult to detect when the isolation occurs. Damage can occur to customer equipment if the generation in the island, no longer under utility control, operates outside of normal voltage and frequency conditions. Customer and utility equipment can be damaged if the main grid recloses into the island out of synchronization. Energized lines within the island present a shock hazard to unsuspecting utility lineworkers who think the lines are dead.

The PV industry has pioneered the development of islanding detection and prevention measures. To satisfy the concerns of electric power providers, commercially-available utility-interconnected PV inverters have implemented a variety of islanding detection and prevention (also called anti-islanding) techniques. The industry has also developed a test procedure to demonstrate the efficacy of these anti-islanding techniques; that procedure is the subject of this document.

This standard provides a consensus test procedure to evaluate the efficacy of islanding prevention measures used by the power conditioner of utility-interconnected PV systems. Note that while this document specifically addresses inverters for photovoltaic systems, with some modifications the setup and procedure may also be used to evaluate inverters used with other generation sources or to evaluate separate anti-islanding devices intended for use in conjunction with PV inverters or other generation sources acting as or supplementing the anti-islanding feature of those sources.

Inverters and other devices meeting the requirements of this document can be considered non-islanding, meaning that under reasonable conditions, the device will detect island conditions and cease to energize the public electric power grid.

UTILITY-INTERCONNECTED PHOTOVOLTAIC INVERTERS – TEST PROCEDURE OF ISLANDING PREVENTION MEASURES

1 Scope

The purpose of this International Standard is to provide a test procedure to evaluate the performance of islanding prevention measures used with utility-interconnected PV systems.

This standard describes a guideline for testing the performance of automatic islanding prevention measures installed in or with single or multi-phase utility interactive PV inverters connected to the utility grid. The test procedure and criteria described are minimum requirements that will allow repeatability. Additional requirements or more stringent criteria may be specified if demonstrable risk can be shown. Inverters and other devices meeting the requirements of this standard are considered non-islanding as defined in IEC 61727.

This standard may be applied to other types of utility-interconnected systems (e.g. inverter-based microturbine and fuel cells, induction and synchronous machines). However, technical review may be necessary for other than inverter-based PV systems.

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