SLOVENSKI STANDARD
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Predstavitev tehničnih podatkov za fotonapetostne razsmernike

Data sheet for photovoltaic inverters

Datenblattangaben für Photovoltaik-Wechselrichter

Fiche technique pour les onduleurs photovoltaïques

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Ta slovenski standard je istoveten z: **EN 50524:2021**

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ICS:

27.160	Sončna energija	Solar energy engineering

SIST EN 50524:2021 **en,fr**

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50524

September 2021

ICS 27.160

Supersedes EN 50524:2009 and all of its amendments and corrigenda (if any)

English Version

Data sheet for photovoltaic inverters

Fiche technique pour les onduleurs photovoltaïques

Datenblattangaben für Photovoltaik-Wechselrichter

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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

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European foreword

This document (EN 50524:2021) has been prepared by CLC/TC 82 “Solar photovoltaic energy systems”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2022-07-26
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2024-07-26

This document supersedes EN 50524:2009 and all of its amendments and corrigenda (if any).

EN 50524:2021 includes the following significant technical changes with respect to EN 50524:2009:

— name plate requirements removed;

— revised list of electrical parameters to be indicated;

— information requirements for systems using external DC/DC converters included;

— maximum noise emission value harmonized with measuring method specified in EN 62109-1.

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1 Scope

This document describes data sheet information for photovoltaic inverters in grid parallel operation.

The intent of this document is to provide minimum information required to configure a safe and optimal system with photovoltaic inverters.

In this context, data sheet information is a technical description separate from the photovoltaic inverter.

NOTE The name plate is a sign of durable construction at or in the photovoltaic inverter. Its content can be found in an earlier version of this standard. For the sake of unique definition, it is sufficient defined in EN 62109-1 and EN 62109-2.

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.

EN 50530, *Overall efficiency of grid connected photovoltaic inverters*

EN 60529, *Degrees of protection provided by enclosures (IP Code) (IEC 60529)*

EN 60664-1, *Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests (IEC 60664-1)*

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EN IEC 60721-3-3, *Classification of environmental conditions - Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations (IEC 60721-3-3)*

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EN IEC 60721-3-4, *Classification of environmental conditions - Part 3-4: Classification of groups of environmental parameters and their severities - Stationary use at non-weatherprotected locations (IEC 60721-3-4)*

EN 61683, *Photovoltaic systems - Power conditioners - Procedure for measuring efficiency (IEC 61683)*

EN 62109-1, *Safety of power converters for use in photovoltaic power systems - Part 1: General requirements*

ISO 216, *Writing paper and certain classes of printed matter - Trimmed sizes - A and B series, and indication of machine direction*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at https://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1 Input side (PV - generator)

3.1.1
maximum input voltage
U_{dcmax}
maximum rated d.c. input voltage which the PCE is designed to withstand from the PV array (i.e.maximum open-circuit voltage), under worst-case conditions of ambient temperature, irradiance, etc.

[SOURCE: IEC 62109-1:2010, modified]

3.1.2
minimum input voltage
U_{dcmin}
minimum input voltage for the inverter to energize the utility grid, independent of mode of operation

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3.1.3
start-up input voltage
$U_{dcstart}$
input voltage at which the inverter starts energizing the utility grid

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3.1.4
rated input voltage
$U_{dc,r}$
input voltage specified by the manufacturer, to which other data sheet information refers

3.1.5
maximum MPP voltage
U_{mppmax}
maximum voltage at which the inverter can deliver its rated power in MPP mode

3.1.6
maximum operating voltage
U_{opmax}
maximum voltage at which the inverter can deliver its rated power

Note 1 to entry: U_{opmax} is used for non MPP inverters instead of U_{mppmax}

3.1.7
minimum MPP voltage
U_{mppmin}
minimum voltage at which the inverter can deliver its rated power in MPP mode

Note 1 to entry: For inverters with independent inputs different U_{mppmin} values may be needed for unbalanced inputs.

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3.1.8
Minimum operating voltage
***U*opmin** (U_{opmin})
minimum voltage at which the inverter can deliver its rated power

Note 1 to entry: U_{opmin} is used for non MPP inverters instead of U_{mppmin}

3.1.9
maximum input current
I_{dcmax}
maximum current at which the inverter can operate. If the inverter has independent inputs, I_{dcmax} is related to each single input

3.1.10
maximum short-circuit DC input current
I_{scmax}
absolute maximum total PV array short circuit current (DC) that the inverter is rated to have connected to its input terminals, under worst-case conditions of ambient temperature, irradiance, etc

Note 1 to entry: This term is based on the term $I_{SC,\ PV}$ in IEC 62109-1. It refers to the absolute maximum current the DC input to the inverter is designed for under conditions of expected use. This differs from the simple sum of the marked I_{SC} ratings of the connected PV modules, since those markings are based on short-circuit conditions under standard test conditions and may be exceeded at temperatures or irradiance levels different from the standard levels.

3.1.11
maximum input power
P_{dcmax}
Maximum PV array power at STC that the inverter is rated to have connected to its input terminals

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Note 1 to entry: The maximum power cannot exceed I_{scmax} multiplied by U_{mppmax} or U_{opmax}. The manufacturer can specify a lower value in order to secure the reliability and lifetime of the inverter.

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3.2 Output side (Grid connection)

3.2.1
maximum grid voltage
U_{acmax}
maximum voltage at which the inverter can energize the grid

3.2.2
minimum grid voltage
U_{acmin}
minimum voltage at which the inverter can energize the grid

3.2.3
nominal grid voltage
U_{acnom}
utility grid voltage to which other data sheet information refers

3.2.4
maximum output current
I_{acmax}
maximum output current that the inverter can deliver in continuous operation

Note 1 to entry: The conditions for tests under continuous operation are specified in EN 62109-1:2010 General conditions for testing.

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3.2.5
rated power
***P*ac,r**
the active power the inverter can deliver in continuous operation

Note 1 to entry: The conditions for tests under continuous operation are specified in EN 62109-1:2010 General conditions for testing.

3.2.6
maximum apparent power
***S*ac,max**
the maximum apparent power the inverter can deliver in continuous operation

Note 1 to entry: The conditions for tests under continuous operation are specified in EN 62109-1:2010 General conditions for testing

3.2.7
nominal frequency
***f*nom**
utility grid frequency at which the inverter performs as specified

3.2.8
maximum frequency
***f*max**
maximum frequency at which the inverter can energize the grid

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3.2.9
minimum frequency
***f*min**
minimum frequency at which the inverter can energize the grid

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3.2.10
night-time power loss
power loss of the inverter, which is supplied from the public grid, when no solar generator power is present and no other night-time services (e.g. grid support) are enabled

3.2.11
active factor
cosphi
for a two-terminal element or a two-terminal circuit under sinusoidal conditions, ratio of the active power to the apparent power

Note 1 to entry: The active factor is equal to the cosine of the displacement angle.

[SOURCE: IEV 131-11-49]

3.3 Optional parameters

3.3.1
rated AC current
***I*ac,r**
rated AC current at rated power ($P_{ac,r}$), and nominal grid voltage (U_{acnom})

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3.3.2
maximum AC output power
P_{acmax}
maximum continuous active power the inverter can deliver under specified voltage or temperature conditions within the inverter's rated range of operation

Note 1 to entry: The maximum AC output power (P_{acmax}) may differ from rated power ($P_{ac,r}$) if the inverter is capable of delivering additional power under specific conditions, for example at temperatures below the inverter's maximum ambient temperature rating, or within specified DC voltage ranges.

3.3.3
total harmonic ratio
total harmonic distortion
THD
ratio of the r.m.s. value of the harmonic content to the r.m.s. value of the fundamental component or the reference fundamental component of an alternating quantity

[SOURCE: IEV 551-20-13]

3.3.4
maximum efficiency
η_{max}
maximum measured DC to AC efficiency recorded

Note 1 to entry: Tested in accordance with IEC 61683.

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