



# SLOVENSKI STANDARD

## SIST EN 60891:2011

01-marec-2011

Nadomešča:  
SIST EN 60891:2001

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### Postopki za temperaturno in sevalno korekcijo izmerjenih karakteristik I-U fotonapetostnih naprav (IEC 60891:2009 (EQV))

Procedures for temperature and irradiance corrections to measured I-V characteristics of photovoltaic devices

Verfahren zur Umrechnung von gemessenen Strom-Spannungs-Kennlinien von photovoltaischen Bauelementen auf andere Temperaturen und Bestrahlungsstärken (IEC 60891:2009)

[SIST EN 60891:2011](#)

Procédures pour les corrections en fonction de la température et de l'éclairement à appliquer aux caractéristiques I-V mesurées des dispositifs photovoltaïques

**Ta slovenski standard je istoveten z: EN 60891:2010**

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#### **ICS:**

27.160      Sončna energija      Solar energy engineering

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 60891**

March 2010

ICS 27.160

Supersedes EN 60891:1994

English version

**Photovoltaic devices -  
Procedures for temperature and irradiance corrections  
to measured I-V characteristics  
(IEC 60891:2009)**

Dispositifs photovoltaïques -  
Procédures pour les corrections  
en fonction de la température  
et de l'éclairement à appliquer  
aux caractéristiques I-V mesurées  
(CEI 60891:2009)

Verfahren zur Umrechnung  
von gemessenen Strom-Spannungs-  
Kennlinien von photovoltaischen  
Bauelementen auf andere Temperaturen  
und Bestrahlungsstärken  
(IEC 60891:2009)

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**CENELEC**

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

**Central Secretariat: Avenue Marnix 17, B - 1000 Brussels**



## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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 When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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 reference solar devices	EN 60904-2	-
IEC 60904-7	-	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices	EN 60904-7	-
IEC 60904-9	-	Photovoltaic devices - Part 9: Solar simulator performance requirements	EN 60904-9	-
IEC 60904-10	-	Photovoltaic devices - Part 10: Methods of linearity measurement	EN 60904-10	-

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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

Photovoltaic devices – Procedures for temperature and irradiance corrections to measured I-V characteristics

Dispositifs photovoltaïques – Procédures pour les corrections en fonction de la température et de l'éclairement à appliquer aux caractéristiques I-V mesurées

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## PHOTOVOLTAIC DEVICES – PROCEDURES FOR TEMPERATURE AND IRRADIANCE CORRECTIONS TO MEASURED I-V CHARACTERISTICS

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International Standard IEC 60891 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This second edition cancels and replaces the first edition issued in 1987 and its Amendment 1 (1992) and constitutes a technical revision.

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

- extends edition 1 translation procedure to irradiance change during I-V measurement;
- adds 2 new translation procedures;
- revises procedure for determination of temperature coefficients to include PV modules;
- defines new procedure for determination of internal series resistance;
- defines new procedure for determination of curve correction factor.

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

FDIS	Report on voting
82/581/FDIS	82/588/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 maintenance result 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.

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# PHOTOVOLTAIC DEVICES – PROCEDURES FOR TEMPERATURE AND IRRADIANCE CORRECTIONS TO MEASURED I-V CHARACTERISTICS

## 1 Scope

This standard defines procedures to be followed for temperature and irradiance corrections to the measured I-V (current-voltage) characteristics of photovoltaic devices. It also defines the procedures used to determine factors relevant for these corrections. Requirements for I-V measurement of photovoltaic devices are laid down in IEC 60904-1.

NOTE 1 The photovoltaic devices include a single solar cell with or without a protective cover, a sub-assembly of solar cells, or a module. A different set of relevant parameters for I-V correction applies for each type of device. Although the determination of temperature coefficients for a module (or sub-assembly of cells) may be calculated from single cell measurements, it should be noted that the internal series resistance and curve correction factor should be separately measured for a module or subassembly of cells.

NOTE 2 The term “test specimen” is used to denote any of these devices.

NOTE 3 Care should be taken regarding the use of I-V correction parameters. The parameters are valid for the PV device for which they have been measured. Variations may occur within a production lot or the type class.

## 2 Normative references

The following referenced documents are indispensable for the application 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 60904-1, *Photovoltaic devices – Part 1: Measurements of photovoltaic current-voltage characteristics*

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

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

IEC 60904-9, *Photovoltaic devices – Part 9: Solar simulator performance requirements*

IEC 60904-10, *Photovoltaic devices – Part 10: Methods of linearity measurement*

## 3 Correction procedures

### 3.1 General

Three procedures for correcting measured current-voltage characteristics to other conditions of temperature and irradiance (such as STC) can be applied. The first is identical to the procedure given in Edition 1 of this standard, but the equation has been rewritten for easier understanding. The second procedure is an alternative algebraic correction method which yields better results for large irradiance corrections (>20 %). Both procedures require that correction parameters of the PV device are known. If not known they need to be determined prior to performing the correction. The third procedure is an interpolation method which does not require correction parameters as input: It can be applied when a minimum of three current-voltage curves have been measured for the test device. These three current-voltage curves span the temperature and irradiance range for which the correction method is applicable.