SLOVENSKI STANDARD
SIST EN 61725:2001

01-september-2001

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Analytical expression for daily solar profiles

Analytische Darstellung für solare Tagesstrahlungsprofile

Expression analytique des profils solaires journaliers

Ta slovenski standard je istoveten z: **EN 61725:1997**

ICS:

27.160	Ù[} }aÁ}^¦*å�æc	Solar energy engineering

SIST EN 61725:2001 **en**

2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 61725

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ICS 27.160

English version

Analytical expression for daily solar profiles
(IEC 61725:1997)

Expression analytique des profils
solaires journaliers
(CEI 61725:1997)

Analytische Darstellung für solare
Tagesstrahlungsprofile
(IEC 61725:1997)

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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 Central Secretariat has the same status as the official versions.

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CENELEC

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

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Foreword

The text of document 82/164/FDIS, future edition 1 of IEC 61725, prepared by IEC TC 82, Solar photovoltaic energy systems, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61725 on 1997-07-01.

The following dates were fixed:

– latest date by which the EN has to be implemented
  at national level by publication of an identical
  national standard or by endorsement   (dop)   1998-04-01

– latest date by which the national standards conflicting
  with the EN have to be withdrawn   (dow) 1998-04-01

Endorsement notice

The text of the International Standard IEC 61725:1997 was approved by CENELEC as a European Standard without any modification.

NORME INTERNATIONALE

INTERNATIONAL STANDARD

CEI
IEC
61725

Première édition
First edition
1997-05

**Expression analytique
des profils solaires journaliers**

**Analytical expression
for daily solar profiles**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ANALYTICAL EXPRESSION FOR DAILY SOLAR PROFILES

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 61725 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

FDIS	Report on voting
82/164/FDIS	82/169/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.

INTRODUCTION

This International Standard provides module manufacturers, installers and users with a means for synthesizing solar irradiance profiles. These profiles can be used as a reference in conjunction with user-supplied performance simulation programs for sizing and comparing photovoltaic systems. They can also be used in tenders or proposals.

NOTE – To compare PV systems, perform system sizing and evaluate specific PV system performance, other parameters such as ambient temperature, wind speed, spectral irradiance distribution and PV device characteristics are required.

ANALYTICAL EXPRESSION FOR DAILY SOLAR PROFILES

1 Scope

This procedure provides a normative equation for analytically deriving a set of data points or a curve of irradiance versus time of day for a synthetic solar day.

The coefficients of the normative equation for the analytical solar irradiance profiles are determined from measured or estimated values of maximum solar irradiance, daily solar irradiation and the number of daylight hours. These three input data define the curve of the analytical solar irradiance profiles. Depending on the objectives, these data may represent, for example, the worst winter day of a certain place, or the average day of a summer season, etc.

CAUTION – While the results from the normative equation match measured clear sky data reasonably well, it is not intended to predict or simulate a real day. A daily solar irradiance profile is defined based on user-selected values for peak irradiance, daily irradiation and total daylight hours.

2 Definitions

The following symbols are defined and illustrated in figure 1:

G =   solar irradiance, $W \cdot m^{-2}$

G_{max} =   the desired maximum solar irradiance at solar noon ($t = 0$), $W \cdot m^{-2}$

H =   daily solar irradiation, $Wh \cdot m^{-2}$
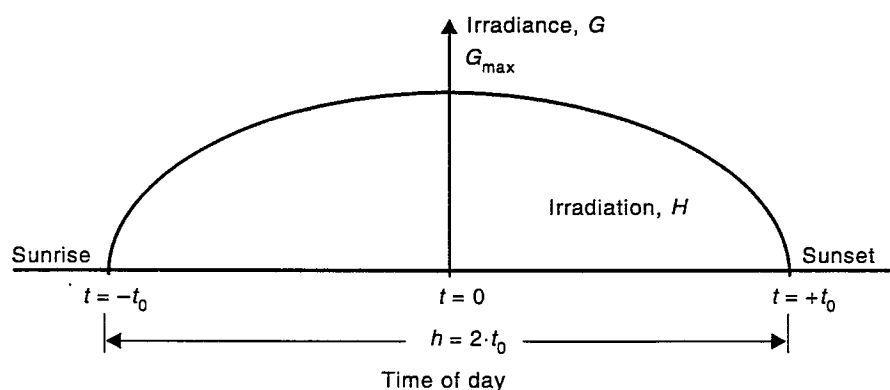
H_d =   the desired daily solar irradiation for the synthesized solar day profile, $Wh \cdot m^{-2}$

t =   time of day

$-t_0$ =   time of sunrise

$+t_0$ =   time of sunset

h =   daylight hours ($2 \cdot t_0$), hours

Figure 1 – Definition of symbols

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