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Rating of direct coupled photovoltaic (PV) pumping systems

Bemessungsdaten direktgekuppelter photovoltaischer (PV) - Pumpensysteme

Evaluation des systèmes photovoltaïques de pompage à couplage direct

Ta slovenski standard je istoveten z: EN 61702:1999

[SIST EN 61702:2001](https://standards.iteh.ai/catalog/standards/sist/52950b22-fd99-4d1e-966d-f43c8d58282/sist-en-61702-2001)

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ICS:

27.160

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Solar energy engineering

SIST EN 61702:2001

en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 61702

September 1999

ICS 27.160

English version

**Rating of direct coupled photovoltaic (PV) pumping systems
(IEC 61702:1995)**

Evaluation des systèmes
photovoltaïques de pompage à
couplage direct
(CEI 61702:1995)

Bemessungsdaten direktgekuppelter
photovoltaischer (PV) - Pumpensysteme
(IEC 61702:1995)

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CENELEC

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of the International Standard IEC 61702:1995, prepared by IEC TC 82, Solar photovoltaic energy systems, was submitted to the formal vote and was approved by CENELEC as EN 61702 on 1999-08-01 without any modification.

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) 2000-08-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2002-08-01

Endorsement notice

The text of the International Standard IEC 61702:1995 was approved by CENELEC as a European Standard without any modification.

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Evaluation des systèmes photovoltaïques
de pompage à couplage direct

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

RATING OF DIRECT COUPLED PHOTOVOLTAIC (PV)
PUMPING SYSTEMS

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 cooperation 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 1702 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

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

DIS	Report on voting
82(CO)30	82(CO)49

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

RATING OF DIRECT COUPLED PHOTOVOLTAIC (PV) PUMPING SYSTEMS

1 Scope

This International Standard defines predicted short-term characteristics (instantaneous and for a typical daily period) of direct coupled photovoltaic (PV) water pumping systems. It also defines minimum actual performance values to be obtained on-site. It does not address PV pumping systems with batteries.

The parameters defining the photovoltaic power generating system (PVPGS) and the standard days, used to provide data in figure 1, should be in accordance with IEC standards, in preparation, on the reference solar day.

2 Short term predicted characteristics

2.1 Daily and instantaneous predicted delivery curves

The curves shown in figure 1 and figure 2 shall be given, and shall take into account the following parameters:

- H_i ($\text{kWh} \cdot \text{m}^{-2} \cdot \text{day}^{-1}$): mean daily in-plane total irradiation. See values 4, 6, and 7 $\text{kWh} \cdot \text{m}^{-2} \cdot \text{day}^{-1}$ given in figure 1;
- H_{io} ($\text{kWh} \cdot \text{m}^{-2} \cdot \text{day}^{-1}$): mean daily in-plane total irradiation during the reference period;
- G_i ($\text{W} \cdot \text{m}^{-2}$): in-plane total irradiance. Values are given in figure 2 for $250 \text{ W} \cdot \text{m}^{-2}$, $500 \text{ W} \cdot \text{m}^{-2}$, $800 \text{ W} \cdot \text{m}^{-2}$, $1\,000 \text{ W} \cdot \text{m}^{-2}$, and the higher value G_{it} of G_i , for which the instantaneous delivery, q_o , is equal to zero;
- G_{io} ($\text{W} \cdot \text{m}^{-2}$): in-plane reference total irradiance;
- Mmt_o (m): total manometric head. Values are given in figures 1 and figure 2 for $0,75 \text{ Mmt}_o$, $1,15 \text{ Mmt}_o$ and $1,3 \text{ Mmt}_o$;
- T_{amd} ($^{\circ}\text{C}$): on-site mean daylight ambient temperature for the reference period or estimated ambient temperature for an $800 \text{ W} \cdot \text{m}^{-2}$ total in-plane irradiance for a day with an in-plane total irradiation of $6 \text{ kWh} \cdot \text{m}^{-2} \cdot \text{day}^{-1}$.

NOTE - As long as there is no IEC standard for the reference solar day, daily irradiation and a temperature profile must be presented beside the predicted daily delivery curves in figure 1.

2.2 Temperature corrections

Reference instantaneous q_o and daily delivery Q_{jo} values shall be given for the two following sets of values:

- Mmt_o , H_i , $T_{amd} + 10 \text{ }^{\circ}\text{C}$;
- Mmt_o , H_i , $T_{amd} - 10 \text{ }^{\circ}\text{C}$.

3 On-site tests

3.1 Conditions to be verified during on site tests

$$0,75 \text{ Mmt}_o < \text{actual Mmt} < 1,3 \text{ Mmt}_o$$

$$T_{\text{amd}} - 10 \text{ }^{\circ}\text{C} < \text{actual } T_{\text{amd}} < T_{\text{amd}} + 10 \text{ }^{\circ}\text{C}$$

$$0,8 H_{i_o} < \text{actual } H_i < 1,2 H_{i_o}$$

$$0,8 G_{i_o} < \text{actual } G_i < 1,2 G_{i_o}$$

3.2 Procedures (under consideration)

4 Performance requirements

4.1 Instantaneous delivery, q

The actual measured delivery, extrapolated to reference conditions, shall be higher than 90 % of the predicted reference delivery.

Between the $G_{i_o}/2$ and G_{i_o} , values of on-site total in plane irradiance, instantaneous actual measured deliveries shall be higher than 90 % of predicted instantaneous deliveries for measured irradiances, ambient temperature, and total manometric head.

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4.2 Daily delivery, Q_d

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The actual measured daily delivery, corrected to reference conditions, shall be greater than K % of the predicted daily delivery, where K is greater than 80.