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Responsible committee: GEL/82 Photovoltaic Energy Systems

Interested committees:

Title: BS EN IEC 63349-1 Photovoltaic direct-driven appliance controllers

Part 1: General Requirement

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Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

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IEC TC 82 : SOLAR PHOTOVOLTAIC ENERGY SYSTEMS	
SECRETARIAT: United States of America	SECRETARY: Mr George Kelly
OF INTEREST TO THE FOLLOWING COMMITTEES:	PROPOSED HORIZONTAL STANDARD: ☐ Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☐ ENVIRONMENT ☐ QUALITY ASSURANCE ☒ SAFETY	

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Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Recipients of this document are invited to submit, with their comments, notification of any local regulations or technical reasons that may exist and should be considered should this proposal proceed, recognizing that failure to address such requirements could result in the need for new or existing "In Some Countries" clauses. (See [AC/22/2007](#) or [NEW GUIDANCE DOC](#)).

TITLE:

Photovoltaic direct-driven appliance controllers – Part 1: General requirement

NOTE FROM TC/SC OFFICERS:

This project was discussed and supported by WG6 during their meeting in 2023-10.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PHOTOVOLTAIC DIRECT-DRIVEN APPLIANCE CONTROLLOERS

Part 1: General requirements

FOREWORD

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IEC 63349-1 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is a Technical Specification..

The text of this International Standard is based on the following documents:

Draft	Report on voting
XX/XX/FDIS	XX/XX/RVD

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

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available

at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at <http://www.iec.ch/standardsdev/publications>.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

PHOTOVOLTAIC DIRECT-DRIVEN APPLIANCE CONTROLLERS –

Part 1: General requirements

1 Scope

IEC 63349 series documents are applicable to photovoltaic direct-driven appliance (PVDDA) controllers. The controller is applicable to systems with voltage not higher than 1500V DC or 1000V AC, and the output power of variable frequency drive (VFD) not higher than 30kW.

PVDDA controller is a device used for transforming, regulating and controlling power among sources (such as PV array, grid, energy storage, etc.) and appliance loads (such as air-conditioner, refrigerator, water pump, etc.). As a PVDDA controller, power generated by PV system is directly applied to the load, while grid may be connected, but not necessary. PVDDA controller shall have internal communication among power conversion components and external communication with power sources. But communication protocols are not covered in this document.

A PVDDA controller may be integrated or built-in with Maximum Power Point Tracking (MPPT), a VFD, a bi-directional grid-connected AC/DC power converter, an energy storage charger/discharger, and converters for DC or AC appliance, etc. However, many of these devices have their own applicable standards, therefore, this document does not intend to create any new requirements for these devices, instead, it will focus on the controller itself.

Safety requirements of PVDDA controller are not covered by this document. Safety requirements of conversion components of PVDDA controller are listed as follows:

- a) converter connected to PV array, IEC 62109-1 is applicable;
- b) converter connected to grid, IEC 62909-1 is applicable;
- c) converter connected to energy storage, IEC 62509 is applicable;
- d) variable frequency drive, IEC 60730-1 is applicable.

The definition and the test procedure of PVDDA controller's efficiency are not in the scope of this part of the document, and they will be given in part 3 of this document (under development).

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.

IEC 61727:2004, *Photovoltaic (PV) systems – Characteristics of the utility interface*

IEC TS 61836, *Solar photovoltaic energy systems - Terms, definitions and symbols*

IEC 62093, *Photovoltaic system power conversion equipment-design qualification and type approval*

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

IEC 62109-2, *Safety of power converters for use in photovoltaic power systems – Part 2: Particular requirements for inverters*

IEC TS 62786-1, *Distributed energy resources connection with the grid*

IEC 62891, *Maximum power point tracking efficiency of grid connected photovoltaic inverters*

IEC 62909-1, *Bi-directional grid-connected power converters – Part 1: General requirements*

IEC TS 63106-1, *Simulators used for testing of photovoltaic power conversion equipment – Recommendations – Part 1: AC power simulators*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61836 apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

PV direct-driven appliance (PVDDA)

appliance which directly uses DC electrical power generated by PV array, which may be connected to grid, energy storage, or other sources, but not necessary

3.2

PV direct-driven appliance (PVDDA) controller

device of PVDDA used for power transformation, power regulation and power control

3.3

variable frequency drive (VFD)

inverter which controls speed of the motor of variable frequency appliance by adjusting frequency, for instance, drive component of compressor of variable frequency air conditioner

3.4

curtailment

reduction of the active power output of renewable energy generating units or power plants below the maximum which could be fed into an electric power network in the prevailing conditions

[SOURCE: IEC 62934:2021, 3.7.5]

3.5

load management

reduction or disconnection of power usage from grid, either automatically or manually (usually as requested by the electric power network operator)

3.6

set frequency of VFD

the target frequency of VFD calculated according to the working condition and working mode of the load

4 Description of PVDDA controller

The typical schematic drawing of PVDDA controller is shown in Figure 1.