

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

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**Photovoltaic (PV) arrays – Design requirements**

**Groupes photovoltaïques (PV) – Exigences de conception**





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INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## CONTENTS

|   |    |
|---|----|
| FOREWORD.....   | 5  |
| 1 Scope and object.....   | 7  |
| 2 Normative references.....   | 7  |
| 3 Terms, definitions, symbols and abbreviated terms.....                        | 9  |
| 3.1 Terms, definitions and symbols.....   | 9  |
| 3.2 Abbreviations.....  | 16 |
| 4 Compliance with IEC 60364 (all parts).....                                    | 16 |
| 5 PV array system configuration.....  | 16 |
| 5.1 General.....  | 16 |
| 5.1.1 Functional configuration of a PV system.....                              | 16 |
| 5.1.2 PV system architectures.....  | 17 |
| 5.1.3 Array electrical diagrams.....  | 17 |
| 5.1.4 Use of PCE with multiple DC inputs.....                                   | 22 |
| 5.1.5 Strings constructed using DC conditioning units.....                      | 23 |
| 5.1.6 Series-parallel configuration.....  | 24 |
| 5.1.7 Batteries in systems.....   | 25 |
| 5.1.8 Considerations due to prospective fault conditions within a PV array..... | 25 |
| 5.1.9 Considerations due to operating temperature.....                          | 25 |
| 5.1.10 Performance issues.....  | 26 |
| 5.2 Mechanical design.....  | 26 |
| 5.2.1 General.....  | 26 |
| 5.2.2 Thermal aspects.....  | 27 |
| 5.2.3 Mechanical loads on PV structures.....                                    | 27 |
| 5.2.4 Corrosion.....  | 27 |
| 6 Safety issues.....  | 28 |
| 6.1 General.....  | 28 |
| 6.1.1 Overview.....   | 28 |
| 6.1.2 Separation of PV array from main AC power output circuits.....            | 28 |
| 6.2 Protection against electric shock.....                                      | 29 |
| 6.2.1 General.....  | 29 |
| 6.2.2 Protective measure: double or reinforced insulation.....                  | 29 |
| 6.2.3 Protective measure: extra-low-voltage provided by SELV or PELV.....       | 29 |
| 6.3 Protection against thermal effects.....                                     | 29 |
| 6.4 Protection against the effects of insulation faults.....                    | 29 |
| 6.4.1 General.....  | 29 |
| 6.4.2 Detection and fault indication requirements.....                          | 30 |
| 6.5 Protection against overcurrent.....   | 34 |
| 6.5.1 General.....  | 34 |
| 6.5.2 Requirement for overcurrent protection.....                               | 34 |
| 6.5.3 Requirement for string overcurrent protection.....                        | 34 |
| 6.5.4 Requirement for sub-array overcurrent protection.....                     | 35 |
| 6.5.5 Overcurrent protection sizing.....  | 35 |
| 6.5.6 Overcurrent protection in PV systems connected to batteries.....          | 37 |
| 6.5.7 Overcurrent protection location.....                                      | 37 |
| 6.6 Protection against effects of lightning and overvoltage.....                | 38 |
| 6.6.1 General.....  | 38 |

|                       |  |    |
|-----------------------|--|----|
| 6.6.2                 | Protection against overvoltage .....   | 38 |
| 7                     | Selection and erection of electrical equipment.....                              | 39 |
| 7.1                   | General.....   | 39 |
| 7.2                   | PV array maximum voltage.....  | 40 |
| 7.3                   | Component requirements .....   | 40 |
| 7.3.1                 | General .....  | 40 |
| 7.3.2                 | PV modules .....   | 41 |
| 7.3.3                 | PV array and PV string combiner boxes.....                                       | 41 |
| 7.3.4                 | Circuit breakers .....   | 42 |
| 7.3.5                 | Fuses .....  | 42 |
| 7.3.6                 | Disconnectors and switch-disconnectors.....                                      | 42 |
| 7.3.7                 | Cables .....   | 43 |
| 7.3.8                 | Segregation of AC and DC circuits .....  | 46 |
| 7.3.9                 | Plugs, sockets and connectors .....  | 46 |
| 7.3.10                | Wiring in combiner boxes .....   | 47 |
| 7.3.11                | Bypass diodes .....  | 47 |
| 7.3.12                | Blocking diodes.....   | 47 |
| 7.3.13                | Power conversion equipment (PCE) including DC conditioning units<br>(DCUs) ..... | 47 |
| 7.4                   | Location and installation requirements.....                                      | 48 |
| 7.4.1                 | Disconnecting means .....  | 48 |
| 7.4.2                 | Earthing and bonding arrangements .....  | 49 |
| 7.4.3                 | Wiring system .....  | 54 |
| 8                     | Acceptance .....   | 56 |
| 9                     | Operation/maintenance.....   | 56 |
| 10                    | Marking and documentation .....  | 56 |
| 10.1                  | Equipment marking .....  | 56 |
| 10.2                  | Requirements for signs.....  | 56 |
| 10.3                  | Identification of a PV installation.....   | 57 |
| 10.4                  | Labelling of PV array and PV string combiner boxes .....                         | 57 |
| 10.5                  | Labelling of disconnection devices.....  | 57 |
| 10.5.1                | General .....  | 57 |
| 10.5.2                | PV array disconnecting device.....   | 57 |
| 10.6                  | Documentation.....   | 57 |
| Annex A (informative) | Examples of signs.....   | 58 |
| Annex B (informative) | Examples of system functional earthing configurations in PV<br>arrays.....       | 59 |
| Annex C (informative) | Blocking diode .....   | 61 |
| C.1                   | Introduction.....  | 61 |
| C.2                   | Use of blocking diodes to prevent overcurrent/fault current in arrays .....      | 61 |
| C.3                   | Examples of blocking diode use in fault situations.....                          | 61 |
| C.3.1                 | General .....  | 61 |
| C.3.2                 | Short circuit in PV string.....  | 61 |
| C.4                   | Specification of blocking diode .....  | 63 |
| C.5                   | Heat dissipation design for blocking diode .....                                 | 63 |
| Annex D (informative) | Arc fault detection and interruption in PV arrays .....                          | 65 |
| Annex E (normative)   | DVC limits .....   | 66 |
| Bibliography          | .....  | 67 |

|  |    |
|--|----|
| Figure 1 – General functional configuration of a PV powered system.....  | 17 |
| Figure 2 – PV array diagram – single string example .....  | 18 |
| Figure 3 – PV array diagram – multiple parallel string example .....   | 19 |
| Figure 4 – PV array diagram – multiple parallel string example with array divided into sub-arrays .....                    | 20 |
| Figure 5 – PV array example using a PCE with multiple MPPT DC inputs .....   | 21 |
| Figure 6 – PV array example using a PCE with multiple DC inputs internally connected to a common DC bus .....              | 22 |
| Figure 7 – PV string constructed using DC conditioning units.....  | 24 |
| Figure 8 – Example of a PV array diagram where strings are grouped under one overcurrent protection device per group ..... | 36 |
| Figure 9 – Examples of reinforced protection of wiring .....   | 45 |
| Figure 10 – PV array exposed conductive parts functional earthing/bonding decision tree ...                                | 51 |
| Figure 11 – Exposed conductive parts earthing in a PV array.....   | 52 |
| Figure 12 – Examples of PV string wiring with minimum loop area .....  | 55 |
| Figure A.1 – Example of sign required on PV array combiner boxes (10.4).....   | 58 |
| Figure A.2 – Example of switchboard sign for identification of PV on a building .....                                      | 58 |
| Figure B.1 – System functional earthing/grounding .....  | 59 |
| Figure B.2 – Examples different PV configurations in common use.....   | 60 |
| Figure C.1 – Effect of blocking diode where there is a short circuit in PV string .....                                    | 62 |
| Figure C.2 – Effect of blocking diode where there is an earth fault on a system with earthing on the minus side .....      | 62 |
| Figure C.3 – Effect of blocking diode where there is an earth fault on a system with positive side earthing .....          | 63 |
| Figure D.1 – Examples of types of arcs in PV arrays.....   | 65 |
| <br>   |    |
| Table 1 – Requirements for different system types based on PCE isolation and PV array functional earthing .....            | 31 |
| Table 2 – Minimum insulation resistance thresholds for detection of failure of insulation to earth .....                   | 32 |
| Table 3 – Rated current of automatic earth fault interrupting means .....  | 33 |
| Table 4 – Voltage correction factors for crystalline and multi-crystalline silicon PV modules .....                        | 40 |
| Table 5 – Minimum current rating of circuits .....   | 44 |
| Table 6 – Disconnection device requirements in PV array installations .....  | 49 |
| Table E.1 – Summary of the limits of the decisive voltage classes.....   | 66 |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PHOTOVOLTAIC (PV) ARRAYS –  
DESIGN REQUIREMENTS**

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International Standard IEC 62548 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems.

This International Standard cancels and replaces the first edition of IEC TS 62548 published in 2013.

This International Standard includes the following significant technical changes with respect to IEC TS 62548:

- a) provisions for systems including DC to DC conditioning units;
- b) considerable revision of Clause 6 on safety issues which includes provisions for protection against electric shock including array insulation monitoring and earth fault detection.

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

| FDIS         | Report on voting |
|--------------|------------------|
| 82/1149/FDIS | 82/1166/RVD      |

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

Attention is drawn to the co-existence of IEC 60364-7-712 and IEC 62548. Both standards have been developed in close coordination by different technical committees.

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

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# PHOTOVOLTAIC (PV) ARRAYS – DESIGN REQUIREMENTS

## 1 Scope and object

This International Standard sets out design requirements for photovoltaic (PV) arrays including DC array wiring, electrical protection devices, switching and earthing provisions. The scope includes all parts of the PV array up to but not including energy storage devices, power conversion equipment or loads. An exception is that provisions relating to power conversion equipment are covered only where DC safety issues are involved. The interconnection of small DC conditioning units intended for connection to PV modules are also included.

The object of this document is to address the design safety requirements arising from the particular characteristics of photovoltaic systems. Direct current systems, and PV arrays in particular, pose some hazards in addition to those derived from conventional AC power systems, including the ability to produce and sustain electrical arcs with currents that are not greater than normal operating currents.

In grid connected systems, the safety requirements of this document are however critically dependent on the inverters associated with PV arrays complying with the requirements of IEC 62109-1 and IEC 62109-2.

Installation requirements are also critically dependent on compliance with the IEC 60364 series (see Clause 4).

PV arrays of less than 100 W and less than 35 V DC open circuit voltage at STC are not covered by this document.

PV arrays in grid connected systems connected to medium or high voltage systems are not covered in this document. Variations and additional requirements for large-scale ground mounted PV power plants with restricted access to personnel will also be addressed in IEC TS 62738<sup>1</sup>.

Additional requirements may be needed for more specialized installations, for example concentrating systems, tracking systems or building integrated PV.

The present international standard also includes extra protection requirements of PV arrays when they are directly connected with batteries at the DC level.

## 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 60228, *Conductors of insulated cables*

IEC 60269-6, *Low-voltage fuses – Part 6: Supplementary requirements for fuse-links for the protection of solar photovoltaic energy systems*

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<sup>1</sup> Under preparation. Stage at the time of publication: IEC 2CD 62738.