SLOVENSKI STANDARD
SIST EN IEC 63409-3:2026

01-april-2026

Povezava fotonapetostnih sistemov za proizvodnjo električne energije z omrežjem - Preskušanje opreme za pretvorbo električne energije - 3. del: Osnovni postopki

Photovoltaic power generating systems connection with grid - Testing of power conversion equipment - Part 3: Basic operations

Photovoltaische Stromerzeugungssysteme mit Netzanschluss – Prüfung von Energieumwandlungsanlagen Teil 3: Grundlegende Funktionen

Systèmes de production d'énergie photovoltaïque connectés au réseau électrique - Essais des équipements de conversion de puissance - Partie 3: Opérations de base

Ta slovenski standard je istoveten z: **EN IEC 63409-3:2026**

ICS:

27.160	Sončna energija	Solar energy engineering
29.240.01	Omrežja za prenos in distribucijo električne energije na splošno	Power transmission and distribution networks in general

SIST EN IEC 63409-3:2026 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN IEC 63409-3

January 2026

ICS 27.160

English Version

Photovoltaic power generating systems connection with the grid - Testing of power conversion equipment - Part 3: Basic operations (IEC 63409-3:2025)

Systèmes de production d'énergie photovoltaïque connectés au réseau - Essais des équipements de conversion de puissance - Partie 3: Opérations de base (IEC 63409-3:2025)

Photovoltaische Stromerzeugungssysteme mit Netzanschluss - Prüfung von Energieumwandlungsanlagen Teil 3: Grundlegende Funktionen (IEC 63409-3:2025)

This European Standard was approved by CENELEC on 2026-01-07. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN IEC 63409-3:2026 E

European foreword

The text of document 82/2456/FDIS, future edition 1 of IEC 63409-3, prepared by TC 82 "Solar photovoltaic energy systems" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63409-3:2026.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2027-01-31
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2029-01-31

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 63409-3:2025 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 61000-2-2:2002	NOTE	Approved as EN 61000-2-2:2002 (not modified)
IEC 61000-4-27:2000	NOTE	Approved as EN 61000-4-27:2000 (not modified)
IEC 61000-4-30	NOTE	Approved as EN IEC 61000-4-30
IEC 61850-7-420	NOTE	Approved as EN IEC 61850-7-420
IEC 61850-7-4	NOTE	Approved as EN 61850-7-4
IEC 62053-23:2020	NOTE	Approved as EN IEC 62053-23:2021 (not modified) +A11:2021
IEC 62109-1:2010	NOTE	Approved as EN 62109-1:2010 (not modified)
IEC 62116	NOTE	Approved as EN 62116
IEC 62446-1	NOTE	Approved as EN 62446-1
IEC 60375	NOTE	Approved as EN IEC 60375

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC/TS 61836	-	Solar photovoltaic energy systems - Terms, definitions and symbols	-	-

IEC 63409-3

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INTERNATIONAL STANDARD

Photovoltaic power generating systems connection with the grid - Testing of power conversion equipment -
Part 3: Basic operations

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CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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Photovoltaic power generating systems connection with the grid - Testing of power conversion equipment - Part 3: Basic operations

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as “IEC Publication(s)”). 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. 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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IEC 63409-3 has been prepared by IEC technical committee 82: Solar photovoltaic energy systems. It is an International Standard.

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

Draft	Report on voting
82/2456/FDIS	82/2525/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 www.iec.ch/publications.

A list of all parts in the IEC 63409 series, published under the general title *Photovoltaic power generating systems connection with the grid – Testing of power conversion equipment*, can be found on the IEC website.

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, or
– revised.

INTRODUCTION

This document gives test procedures for confirming the basic operation characteristics of power conversion equipment (PCE).

Part 3 confirms basic power conversion control of PCE at steady state condition and at transient response. Figure 1 shows the relationships of the seven parts in the IEC 63409 series. Part 3 is focused on the control functions in PCE with respect to power conversion. Power flow control and grid support functions will generate active and reactive power commands according to the grid conditions. The commands are sent to power conversion control, and power conversion control will make current or voltage references, which manipulate signals for the switching devices.

It is important to confirm the basic control performance of the PCE as power conversion equipment without power flow control and grid support functions, so that additional functions such as power flow control and grid support functions can perform appropriately.

The responses of PCE against abnormal grid conditions will be covered in Part 4 (IEC 63409-4).

Power quality of the PCE output will be covered in Part 5 (IEC 63409-5).

Power flow control and grid support functions will be covered in Part 6 (IEC 63409-6).

Responses against commands through communication will be covered Part 7 (IEC 63409-7).

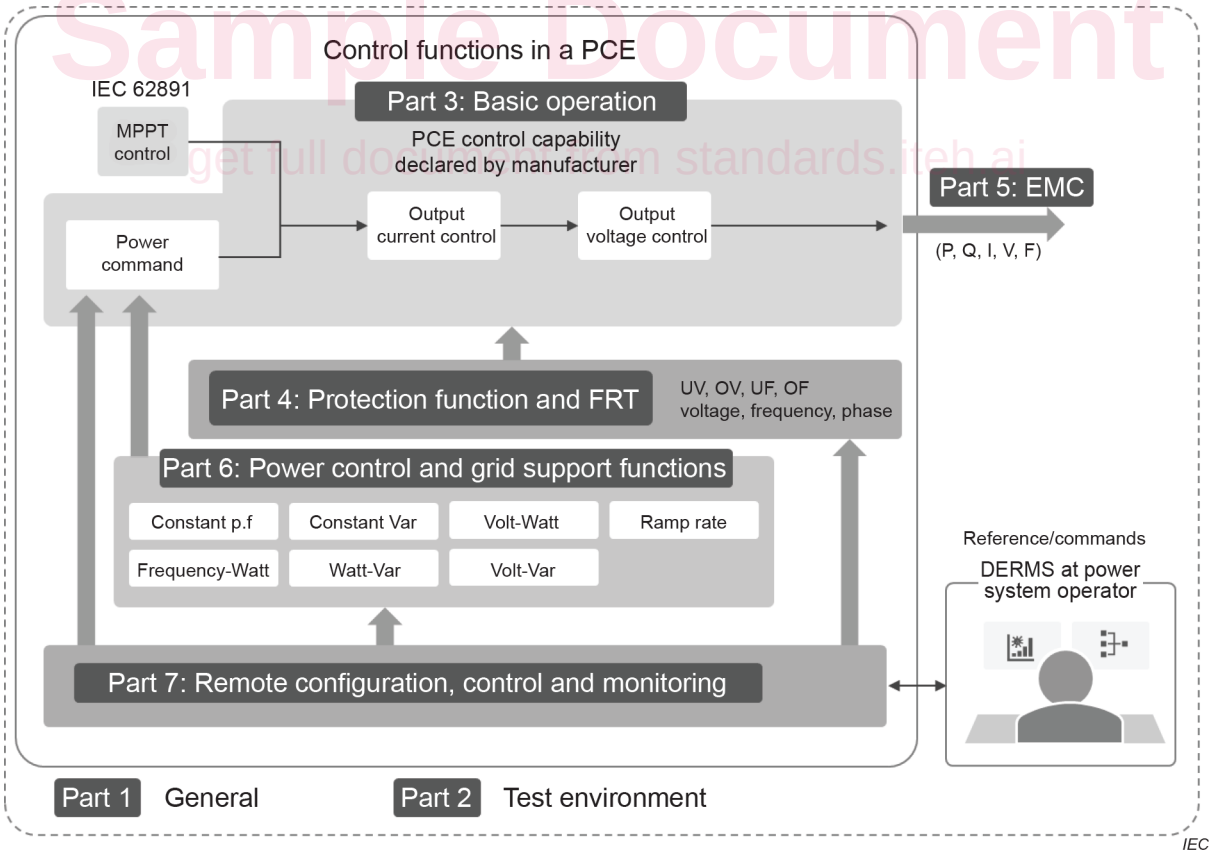

Figure 1 – Scopes of IEC 63409 series

1 Scope

This document specifies test procedures for confirming the basic operational characteristics of power conversion equipment (PCE) for use in photovoltaic (PV) power systems with or without energy storage. The basic operational characteristics are the capability of the PCE before any limitations due to internal settings are applied to the PCE to meet specific grid support functions or specific behaviours against abnormal changes.

This document covers the testing of the following items:

a) Steady state characteristics

Test procedures to confirm operable range of PCE at steady state condition are described. The operable ranges in apparent power, active power, reactive power, power factor, grid voltage and grid frequency are confirmed according to the test procedures.

b) Transient-response characteristics

Test procedures to confirm PCE's response against a change of operational condition are described.

Transient-response characteristics to be confirmed are response behaviours against:

- Active power set point change and reactive power set point change
- Grid voltage change, phase angle change, voltage unbalance and frequency change

This document only considers the changes within normal (continuous) operable ranges. Therefore, the behaviours against abnormal changes and grid support functions are out of the scope and are covered in other parts of this series.

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

3 Terms and definitions

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

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

– IEC Electropedia: available at https://www.electropedia.org/

– ISO Online browsing platform: available at https://www.iso.org/obp

3.1
power conversion equipment
PCE
electrical device converting one kind of electrical power from a voltage or current source into another kind of electrical power with respect to voltage, current and frequency

[SOURCE: IEC 62109-1:2010, 3.66, modified – the note to entry has been omitted.]