

Requirements for generating plants to be connected in parallel with distribution networks - Part 10: Tests for conformity assessment of generating units

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 50549-10:2022 sisaldab Euroopa standardi EN 50549-10:2022 ingliskeelset teksti.	This Estonian standard EVS-EN 50549-10:2022 consists of the English text of the European standard EN 50549-10:2022.
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English Version

**Requirements for generating plants to be connected in parallel
with distribution networks - Part 10: Tests for conformity
assessment of generating units**

Exigences relatives aux centrales électriques destinées à
être raccordées en parallèle à des réseaux de distribution -
Partie 10: Essais d'évaluation de la conformité des unités
de production

Anforderungen für zum Parallelbetrieb mit einem Verteilnetz
vorgesehene Erzeugungsanlagen - Teil 10:
Prüfanforderungen für die Konformitätsbeurteilung von
Erzeugungseinheiten

This European Standard was approved by CENELEC on 2022-08-09. 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.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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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

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C.1 Table 26 of EN IEC 60255-181:2019166

C.2 Table 8 of EN 61000-4-13:2002167

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European foreword

This document (EN 50549-10:2022) has been prepared by CLC/TC 8X “System aspects of electrical energy supply”.

The following dates are fixed:

- latest date by which this document has to be (dop) 2023-08-09
implemented at national level by publication of
an identical national standard or by
endorsement
- latest date by which the national standards (dow) 2025-08-09
conflicting with this document have to be
withdrawn

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.

EN 50438:2013 has been superseded by EN 50549-1:2019. However, Annex D of EN 50438:2013 provided requirements on compliance type testing, which is out of the scope of EN 50549-1:2019 resulting in a gap regarding type testing. This document provides requirements for compliance type testing for generating units and closes this gap.

This document has been prepared under a Standardization Request given to CENELEC by the European Commission and the European Free Trade Association.

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.

1 Scope

The purpose of this document is to provide technical guidance for tests on generating units and interface protection to evaluate their electrical characteristics.

NOTE 1 Mechanical issues are taken into account as far as they influence the electrical characteristics.

The evaluation results are intended to be used to demonstrate conformity of generating units to technical requirements for grid connection. In this context the evaluation results can also be used as part of a certification programme.

NOTE 2 Besides the type test results of the generating unit all additional elements for connection to the grid (e.g. transformer, cabling, multiple units) are considered in the evaluation of the final installation of a generating plant.

The requirements to be evaluated are covered in the following standardization documents:

- EN 50549-1:2019: Requirements for generating plants to be connected in parallel with distribution networks
- Part 1: connection to a LV distribution network - Generating plants up to and including Type B
- EN 50549-2:2019: Requirements for generating plants to be connected in parallel with distribution networks
- Part 2: Connection to a MV distribution network - Generating plants up to and including Type B

If grid connection requirements are dealt with in other documents or for other generating module types, where no specific testing procedure is provided, testing methods of this document can be used if applicable.

This document provides evaluation criteria for the conformity assessment of generating units with respect to the abovementioned standardization documents, based on type testing. However, some requirements are applicable on the generating plant level. The assessment of the conformity to these plant requirements are out of the scope of this document. Nevertheless, this document may be used to show the capabilities of a generating unit to be used in a plant.

As a consequence, it is possible that the conformity assessment of a generating unit does not cover all aspects of the above-mentioned standardization documents, typically when a requirement is evaluated on a plant level. Therefore, the conformity assessment report indicates clearly which clauses of this document are covered and which clauses are not covered.

This document recognizes the existence of specific technical test requirements within several member states that must be complied with.

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.

EN 50549-1:2019, *Requirements for generating plants to be connected in parallel with distribution networks - Part 1: Connection to a LV distribution network - Generating plants up to and including Type B*

EN 50549-2:2019, *Requirements for generating plants to be connected in parallel with distribution networks - Part 2: Connection to a MV distribution network - Generating plants up to and including Type B*

EN IEC 60034 (all parts), *Rotating electrical machines*

EN IEC 60034-4-1, *Rotating electrical machines - Part 4-1: Methods for determining electrically excited synchronous machine quantities from tests*

EN 50524, *Data sheet for photovoltaic inverters*

EN 60255-1, *Measuring relays and protection equipment - Part 1: Common requirements*

- EN 60255-26, *Measuring relays and protection equipment - Part 26: Electromagnetic compatibility requirements*
- EN 60255-27, *Measuring relays and protection equipment - Part 27: Product safety requirements*
- EN 60255-127, *Measuring relays and protection equipment - Part 127: Functional requirements for over/under voltage protection*
- EN IEC 60255-181:2019, *Measuring relays and protection equipment - Part 181: Functional requirements for frequency protection*
- EN 60730-1:2016¹, *Automatic electrical controls - Part 1: General requirements*
- EN 61000-3-2, *Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current ≤ 16 A per phase)*
- EN 61000-3-3, *Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection*
- EN 61508-3:2010, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 3: Software requirements*
- EN IEC 61000-3-11, *Electromagnetic compatibility (EMC) - Part 3-11: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems - Equipment with rated current ≤ 75 A and subject to conditional connection*
- EN 61000-3-12, *Electromagnetic compatibility (EMC) - Part 3-12: Limits - Limits for harmonic currents produced by equipment connected to public low-voltage systems with input current >16 A and ≤ 75 A per phase*
- EN 61000-4-7:2002,² *Electromagnetic compatibility (EMC) – Part 4-7: Testing and measurement techniques - General guide on harmonics and interharmonics measurements and instrumentation, for power supply systems and equipment connected thereto*
- EN 61000-4-13:2002,³ *Electromagnetic compatibility (EMC) - Part 4-13: Testing and measurement techniques - Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests*
- EN 61869-2, *Instrument transformers - Part 2: Additional requirements for current transformers*
- EN 61869-3, *Instrument transformers – Part 3: Additional requirements for inductive voltage transformers*
- EN 62116, *Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures*
- EN 62109-2, *Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters*
- EN IEC 61010 (all parts), *Safety requirements for electrical equipment for measurement, control, and laboratory use*
- EN IEC 61326 (all parts), *Electrical equipment for measurement, control and laboratory use - EMC requirements*
- UL 1998:2013, *Standard for Software in Programmable Components*

¹ As amended by EN 60730-1:2016/A1:2019 and EN 60730-1:2016/A2:2022.

² As amended by EN 61000-4-7:2002/A1:2009.

³ As amended by EN 61000-4-13:2002/A1:2009 and EN 61000-4-13:2002/A2:2016.