

ICS 29.160.20

English Version

**Requirements for generating plants to be connected in parallel
with distribution networks - Part 1: Connection to a LV
distribution network above 16 A**

Prescriptions relatives au raccordement de générateurs de plus de 16A par phase - Partie 1: Connexion au réseau de distribution BT

Anforderungen für den Anschluss von Stromerzeugungsanlagen über 16 A je Phase - Teil 1: Anschluss an das Mittelspannungsverteilungsnetz

This Technical Specification was approved by CENELEC on 2014-09-15.

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Foreword

This document (CLC/TS 50549-1:2015) has been prepared by CLC/TC 8X "System aspects of electrical energy supply".

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

This Technical Specification relates to both future European Network Codes and current technical market needs. Its purpose is to give detailed description of functions to be implemented in products.

This Technical Specification is also intended to serve as a technical reference for the definition of national requirements where European Network Codes requirements allow flexible implementation. The stated requirements are solely technical requirements; economic issues regarding, e.g. the bearing of cost are not in the scope of this document.

CLC/TC 8X plans future standardization work in order to ensure the compatibility of this Technical Specification with the evolution of the legal framework.

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1 Scope

The purpose of this Technical Specification is to provide technical guidance on the requirements for generating plants which can be operated in parallel with a distribution network.

For practical reasons, this Technical Specification refers to the distribution system operator in case settings have to be defined and/or provided, even when these settings are to be defined and/or provided by another actor according to national and European legal framework.

NOTE 1 This includes European network codes and their national implementation, as well as further national regulations.

NOTE 2 Further national requirements especially for the connection to the distribution network and the operation of the generating plant can apply.

The requirements of this Technical Specification apply to all generating plants, electrical machinery and electronic equipment, irrespective of the kind of primary energy source and irrespective of the presence of loads in the producer's network that meet all of the following conditions:

- converting any primary energy source into AC electricity;
- connected to a LV distribution network and rated at more than 16 A per phase;
- intended to operate in parallel with this distribution network under normal network operating conditions.

NOTE 3 Generating plants rated up to and including 16 A per phase are covered by EN 50438.

NOTE 4 Generating plants connected to a MV distribution network fall into the scope of CLC/TS 50549-2.

Unless stated differently by the DSO generating plants connected to a medium voltage distribution network with a maximum apparent power up to 100 kVA can comply with this Technical Specification as alternative to the requirements of CLC/TS 50549-2. A different threshold may be defined by the DSO.

This Technical Specification defines connection requirements.

This Technical Specification recognizes the existence of National Standards, Network Codes, and specific technical requirements of the DSOs. These should be complied with.

Excluded from the scope are:

- the selection and evaluation of the point of connection;
- power system impact assessment;
- connection assessment;
- island operation of generating plants, both intentional and unintentional, where no part of the distribution network is involved;
- active front ends of drives feeding energy back into the distribution network for short duration;
- requirements for the safety of personnel as they are already adequately covered by existing European Standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60255-127, *Measuring relays and protection equipment — Part 127: Functional requirements for over/under voltage protection (IEC 60255-127)*

EN 61000-4-30, *Electromagnetic compatibility (EMC) — Part 4-30: Testing and measurement techniques — Power quality measurement methods (IEC 61000-4-30)*

HD 60364-1, *Low-voltage electrical installations — Part 1: Fundamental principles, assessment of general characteristics, definitions (IEC 60364-1)*

HD 60364-5-551, *Low-voltage electrical installations — Part 5-55: Selection and erection of electrical equipment — Other equipment — Clause 551: Low-voltage generating sets (IEC 60364-5-551)*

IEC 60050, *International Electrotechnical Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 60050 and the following apply.

3.1

active factor

for a two-terminal element or a two-terminal circuit under sinusoidal conditions, ratio of the active power to the apparent power

Note 1 to entry: In a three phase system, this is referring to the positive sequence component of the fundamental.

Note 2 to entry: The active factor is equal to the cosine of the displacement angle.

[SOURCE: IEC 131-11-48, modified]

3.2

basic insulation

insulation of hazardous-live-parts which provides basic protection

Note 1 to entry: This concept does not apply to insulation used exclusively for functional purposes.

[SOURCE: IEC 195-06-06]

3.3

basic protection

protection against electric shock under fault-free conditions

[SOURCE: IEC 195-06-01]

3.4

cogeneration

combined heat and power (CHP)

combined generation of electricity and heat by an energy conversion system and the concurrent use of the electric and thermal energy from the conversion system

3.5

converter connected generating technology

technology where a generating unit is connected to a distribution grid through a converter including doubly fed induction machine based technology (DFIG)

3.6

design active power

P_D

maximum AC active power output at an active factor of 0,9 or the active factor specified by the DSO for a certain generating plant or generating technology

3.7

directly coupled generating technology

technology where a generating unit is connected to a distribution grid without any converter

3.8

disconnection

separation of the active parts of the main circuit of the generating plant or unit from the network with mechanical contacts providing at least the equivalent of basic insulation