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Irish Standard
I.S. EN 50438:2013&IS1:2015

Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

I.S. EN 50438:2013&IS1:2015

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EN 50438:2013/IS1:2015

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INTERPRETATION SHEET
FEUILLE D'INTERPRETATION
INTERPRETATIONSBLATT

EN 50438:2013/IS1

May 2015

ICS 29.160.20

English Version

Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks

Exigences pour les installations de micro-génération destinées à être raccordées en parallèle avec les réseaux publics de distribution à basse tension

Anforderungen für den Anschluss von Klein-Generatoren an das öffentliche Niederspannungsnetz

This European Standard was approved by CENELEC on 2015-04-20. 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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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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

EN 50438:2013/IS1:2015

Foreword

This Interpretation Sheet to the European Standard EN 50438:2013 was prepared by CLC/TC 8X "System aspects of electrical energy supply".

Two topics are clarified:

- The considerations when applying EN 50438:2013 instead of EN 50438:2007;
- The intentional delay on the activation of the power response to over-frequency.

EN 50438:2013 has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Text of IS1 to EN 50438:2013

1 Application of EN 50438:2013 instead of EN 50438:2007

Clause

Foreword (dow) 2016-11-04

In its foreword, the latest date by which the national standards conflicting with EN 50438:2013 have to be withdrawn, is fixed to 2016-11-04.

It has been reported that the EN 50438:2013 has some new functionalities that are not yet available in current state-of-the art micro-generators.

Question

What considerations should be made when using EN 50438:2013 instead of EN 50438:2007?

Interpretation:

When a CENELEC standard is published, it contains a date of publication and a date of withdrawal defining the timeframe within which the national standards should be adapted to this new CENELEC standard.

Generally, the date of withdrawal is about 2½ years after the date of publication creating an overlap period where the new standard can co-exist with a conflicting one. In the specific case where a standard has been revised, different versions of a same standard can therefore co-exist. This is the case for EN 50438.

The latest version has been available since December 2013 and until the date of withdrawal (2016-11-04), the previous version of 2007 can still be applied.

In the EN 50438:2013 version, the two most significant changes in the technical requirements to the EN 50438:2007 version are the following:

- introduction of a power reduction capability in case of over-frequency;
- introduction of reactive power capability

TC 8X wants to emphasize that the over-frequency response requirements as described in EN 50438:2013 are important for grid stability and should be applied as soon as possible. The over-frequency response function is commonly implemented in the considered range of generating units.

However, there are other new requirements (e.g. providing reactive power) which are actually not yet commonly implemented in the considered range of generating units. For these new requirements, the industry might need appropriate time to modify their products. Often micro-generators are also certified by independent certification bodies which adds more time to the manufacturing and testing process. For the implementation of these requirements, a period of at least 18 months is considered reasonable.

These aspects should be considered when using EN 50438:2013 instead of EN 50438:2007.

When using EN 50438:2013, there may be a need to wait up to July 2015 for the application of Subclause 4.3.1.

EN 50438:2013/IS1:2015

2 Interpretation on power response to over-frequency

2.1 Subclause 4.2.5 Power response to over-frequency of EN 50438:2013

It has been reported that the function of the intentional delay to the power response to over frequency may be differently interpreted.

The generator shall be capable of activating active power frequency response as fast as technically feasible with an initial delay that shall be as short as possible with a maximum of 2 s. If the initial delay is below 2 s an intentional delay shall be programmable to adjust the total response time to a value between the initial response time and 2 s.

It is not clear from the above paragraph of Subclause 4.2.5 whether the programmable intentional delay is a permanent delay (dead time) within the function or whether it is only a delay to start the execution of the function.

2.2 Question:

Is the intentional delay integrated into the control loop (dead time) of the active power setpoint in case of over-frequency or is it only delaying the activation of the active power control?

2.3 Interpretation:

With the provision described in Subclause 4.2.5 of EN 50438:2013, the intentional delay is only active for the activation of the function, once the function is operating, the established control loop is not intentionally delayed.

NOTE 1 The option of an intentional delay is required since a very fast and undelayed active power frequency response in case of islanding would correct any excess of generation leading to a generation-consumption balance. In these circumstances, an islanding situation with stable frequency would take place, in which the correct behaviour of any LoM detection based on frequency might be hindered.

NOTE 2 The intentional delay is considered relevant for power system stability. For that reason legal regulations might require a mutual agreement on the setting between DSO and TSO.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 50438

December 2013

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Supersedes EN 50438:2007

English version

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CENELEC

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

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Foreword

This document (EN 50438:2013) 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 implemented at national level by publication of an identical national standard or by endorsement (dop) 2014-11-04
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2016-11-04

This document supersedes EN 50438:2007.

EN 50438:2013 includes the following significant technical changes with respect to EN 50438:2007:

- introduction of a power reduction capability in case of over-frequency;
- introduction of reactive power capability
- update of national protection parameters settings in Annex A;
- modification of tests for the verification of interface protections (voltage and frequency);
- modification of the test for islanding detection;
- addition of a test for direct current injection.

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

This European Standard 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 and methods to verify the compliance of the products.

This European Standard is also intended to serve as a technical reference for the definition of national requirements where European Network Codes requirements allow flexible implementation, e.g. settings for power response to over frequency.

CLC/TC 8X plans to review the Standard periodically, in order to ensure its compatibility with the evolution of the legal framework.

1 Scope

This European Standard specifies technical requirements for the protection functions and the operational capabilities of micro-generating plants, designed for operation in parallel with public low-voltage distribution networks.

This European Standard applies irrespectively of the micro-generating plants' primary source of energy, where micro-generation refers to equipment with nominal currents up to and including 16 A per phase, single or multi phase 230/400 V or multi phase 230 V (phase-to-phase nominal voltage).

For practical reasons, this European Standard 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 grid and the operation of the micro-generator can apply as long as they are not in conflict with this EN.

In some countries, this document may be applied to generators with higher nominal currents used mostly in domestic and small commercial installations. These countries are listed in Annex G.

The provisions of this European Standard are not intended to ensure by themselves the safety of DSO personnel or their contracted parties.

The following aspects are included in the scope:

- all micro-generation technologies are applicable.

The following aspects are excluded from the scope:

- multiple units that for one installation, in aggregate, exceed 16 A;
- issues of revenue rebalancing, metering or other commercial matters;
- requirements related to the primary energy source e.g. matters related to gas fired generator units;
- island operation of generating plants, both intentional and unintentional, where no part of the public distribution network is involved;
- active front ends of drives feeding energy back into the distribution network for short duration.

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 50110 (all parts), *Operation of electrical installations*

EN 50160, *Voltage characteristics of electricity supplied by public electricity networks*

HD 60364 (all parts), *Low-voltage electrical installations (IEC 60364 series)*

EN 61000-3-2:2006, *Electromagnetic compatibility (EMC) — Part 3-2: Limits — Limits for harmonic current emissions (equipment input current \leq 16 A per phase) (IEC 61000-3-2:2005)*

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 \leq 16 A per phase and not subject to conditional connection (IEC 61000-3-3)*

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

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