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Irish Standard
I.S. EN 50160:2010&A1:2015&A2:2019&A3:2019

Voltage characteristics of electricity supplied by public electricity networks

I.S. EN 50160:2010&A1:2015&A2:2019&A3:2019

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EN 50160:2010/A2:2019
EN 50160:2010/A3:2019

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National Foreword

I.S. EN 50160:2010&A1:2015&A2:2019&A3:2019 is the adopted Irish version of the European Document EN 50160:2010, Voltage characteristics of electricity supplied by public electricity networks

This document does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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In line with international standards practice the decimal point is shown as a comma (,) throughout this document.

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EUROPEAN STANDARD

EN 50160:2010/A2

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2019

ICS 29.020

English Version

Voltage characteristics of electricity supplied by public electricity networks

Caractéristiques de la tension fournie par les réseaux publics de distribution

Merkmale der Spannung in öffentlichen Elektrizitätsversorgungsnetzen

This amendment A2 modifies the European Standard EN 50160:2010; it was approved by CENELEC on 2019-03-25. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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

EN 50160:2010/A2:2019 (E)

European foreword

This document (EN 50160:2010/A2:2019) 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) 2020-03-20
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-09-20

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.

The purpose of this document is to provide further development of the standard; that relating to:

- clarification concerning defined ranges of power frequency, for the purpose of this standard only;
- a first approach to include power quality issues concerning the frequency range 2 – 150 kHz.

1 Modification to Clause 2

Modify the reference to EN 61000-4-30:2009 to:

EN 61000-4-30:2015 Electromagnetic compatibility (EMC) – Part 4-30: Testing and measurement techniques – Power quality measurement methods (IEC 61000-4-30:2015)

2 Modification to Clause 3

Add the following definitions and renumber the subsequent definitions:

3.10

mains communicating system (MCS)

electrical system using signals to transmit information on electricity supply systems, either on the public electricity distribution network or within installations of network users

3.18

power quality

characteristics of the electricity at a given point on an electrical system, evaluated against a set of reference technical parameters

Note 1 to entry: These parameters might, in some cases, relate to the compatibility between electricity supplied on a network and the loads connected to that network.

3 Modification to 4.1

Add a third bullet point after the first paragraph:

- other phenomena, i.e. phenomena occurring in the presence of mains communicating systems (MCS) and/or equipment using switch-mode technology connected to the grid.

4 Modification to 4.2.1

Renumber the current NOTE as NOTE 2 and start with a new NOTE 1, which reads:

NOTE 1 This standard defines the frequency range for normal network conditions. During exceptional conditions wider frequency tolerances can apply temporarily in order to maintain the continuity of electricity supply.

5 Modification to 4.2.7

Delete 4.2.7 "Mains signaling voltage" and move it, with some modification, to a new subclause 4.4 "Mains communication voltage" (see Clause 6).

6 Addition of a new subclause 4.4

After 4.3.3 Transient overvoltages, add the following new subclause 4.4.

NOTE 1 The tables will need to be renumbered throughout the standard as the table in 4.4 is numbered "Table 4".

NOTE 2 With regard to the recent edition of the standard, which, for mains signalling voltages only, deals with the frequency range 0,1 – 95 kHz, the draft for items 4.4 and 5.4 "Other phenomena" proceeds in considering also the frequency range 0,1 – 2 kHz.

4.4 Other phenomena (see also Annex C)

4.4.1 General

This subclause deals with phenomena which, due to their characteristics, have not been described in the previous subclauses.

Table 4 provides an overview of the situation concerning standardized PQ levels:

EUROPEAN STANDARD

EN 50160:2010/A3

NORME EUROPÉENNE

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Voltage characteristics of electricity supplied by public electricity networks

Caractéristiques de la tension fournie par les réseaux
publics de distribution

Merkmale der Spannung in öffentlichen
Elektrizitätsversorgungsnetzen

This amendment A3 modifies the European Standard EN 50160:2010; it was approved by CENELEC on 2019-03-25. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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European Committee for Electrotechnical Standardization
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Europäisches Komitee für Elektrotechnische Normung

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

EN 50160:2010/A3:2019 (E)

European foreword

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- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022-09-20

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.

The purpose of this document is to update the specification of PQ levels for harmonics, concerning the 15th and 21th harmonic, with regard to the development in loads connected to supply networks.

EUROPEAN STANDARD

EN 50160:2010/A1

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2015

ICS 29.020

English Version

Voltage characteristics of electricity supplied by public electricity networks

Caractéristiques de la tension fournie par les réseaux
publics de distribution

Merkmale der Spannung in öffentlichen
Elektrizitätsversorgungsnetzen

This amendment A1 modifies the European Standard EN 50160:2010; it was approved by CENELEC on 2014-09-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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

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EUROPEAN STANDARD
NORME EUROPÉENNE
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EN 50160

July 2010

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Supersedes EN 50160:2007

English version

Voltage characteristics of electricity supplied by public electricity networks

Caractéristiques de la tension fournie
par les réseaux publics de distribution

Merkmale der Spannung in öffentlichen
Elektrizitätsversorgungsnetzen

This European Standard was approved by CENELEC on 2010-03-01. 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
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Foreword

This European Standard was prepared by Working Group 1, Physical characteristics of electrical energy, of the Technical Committee CENELEC TC 8X, System aspects of electrical energy supply. It was submitted to the formal vote and was approved by CENELEC as EN 50160 on 2010-03-01.

This document is the result of an intensive cooperation between CENELEC and CEER, with involvement of CEER experts in TC 8X WG1 as well as in related Task Forces.

This document supersedes EN 50160:2007.

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

The following dates were fixed:

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- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2015-03-01

The main differences from EN 50160:2007 are:

- new organization of the document by grouping clauses related to events and continuous phenomena;
- modification of some definitions and completion by some new definitions;
- new Clause 6 relevant to voltage characteristics in high voltage networks.

This work has been deemed so important, that before submission for vote, a CENELEC enquiry has been made, where NCs had the opportunity to respond to the most essential questions resulting from the WG discussions. This enquiry resulted in an extensive number of valuable comments, which have been carefully examined for possible consideration either for the voting draft in particular or for further work within WG1 on some main issues. Following that, the draft has been revised in depth, considering in particular the comments received on:

- the subclauses relevant to supply voltage changes, where a new formulation (capable of encompassing the needs expressed by the vast majority of the NCs) has been introduced,
- the new Clause 6, relevant to voltage characteristics in high voltage networks, where limits for harmonics and unbalance have been changed into indicative values, as new measurement surveys are taking place in several European countries, and it has been recognized as appropriate to wait for the relevant results before considering the setting of limits.

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1 Scope and object

1.1 Scope

This European Standard defines, describes and specifies the main characteristics of the voltage at a network user's supply terminals in public low voltage, medium and high voltage AC electricity networks under normal operating conditions. This standard describes the limits or values within which the voltage characteristics can be expected to remain at any supply terminal in public European electricity networks and does not describe the average situation usually experienced by an individual network user.

NOTE 1 For the definitions of low, medium and high voltage see 3 (Definitions).

This European Standard does not apply under abnormal operating conditions, including the following:

- a) a temporary supply arrangement to keep network users supplied during conditions arising as a result of a fault, maintenance and construction work, or to minimize the extent and duration of a loss of supply;
- b) in the case of non-compliance of a network user's installation or equipment with the relevant standards or with the technical requirements for connection, established either by the public authorities or the network operator, including the limits for the emission of conducted disturbances;

NOTE 2 A network user's installation may include load and generation.

- c) in exceptional situations, in particular,
 - 1) exceptional weather conditions and other natural disasters;
 - 2) third party interference;
 - 3) acts by public authorities;
 - 4) industrial actions (subject to legal requirements);
 - 5) force majeure;
 - 6) power shortages resulting from external events.

The voltage characteristics given in this standard are not intended to be used as electromagnetic compatibility (EMC) levels or user emission limits for conducted disturbances in public electricity networks.

The voltage characteristics given in this standard are not intended to be used to specify requirements in equipment product standards and in installation standards.

NOTE 3 The performance of equipment might be impaired if it is subjected to supply conditions which are not specified in the equipment product standard.

This standard may be superseded in total or in part by the terms of a contract between the individual network user and the network operator.

NOTE 4 The sharing of complaint management and problem mitigation costs between the involved parties is outside the scope of EN 50160.

Measurement methods to be applied in this standard are described in EN 61000-4-30.

1.2 Object

The object of this European Standard is to define, describe and specify the characteristics of the supply voltage concerning:

- a) frequency;
- b) magnitude;
- c) waveform;
- d) symmetry of the line voltages.

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