
Disturbances in supply systems caused by household appliances and similar electrical equipment - Part 3: Voltage fluctuations

Disturbances in supply systems caused by household appliances and similar electrical equipment -- Part 3: Voltage fluctuations

Rückwirkungen in stromversorgungsnetzen, die durch Haushaltegeräte und durch ähnliche Einrichtungen verursacht werden - Teil 3: Spannungsschwankungen

Perturbations produites dans les réseaux d'alimentation par les appareils électrodomestiques et les équipements analogues -- Partie 3: Fluctuations de tension

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ICS:

29.240.01	Omrežja za prenos in distribucijo električne energije na splošno	Power transmission and distribution networks in general
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EUROPEAN STANDARD

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Part 1

EUROPAISCHE NORM

April 1987

UDC : 621.391.823: :64.06-83(083.71)

KEY WORDS : Electromagnetic compatibility; disturbances; household electrical appliances; definitions

ENGLISH VERSION

DISTURBANCES IN SUPPLY SYSTEMS CAUSED BY HOUSEHOLD APPLIANCES AND SIMILAR ELECTRICAL EQUIPMENT.
PART 1 : DEFINITIONS.
(IEC 555-1 (1982 - 1st edition))

Perturbations produites dans les réseaux d'alimentation par les appareils électrodomestiques et les équipements analogues
Première partie: Définitions
(CEI 555-1 (1982 - 1ère édition))

Rückwirkungen in Stromversorgungsnetzen, die durch Haushaltgeräte und durch ähnliche elektrische Einrichtungen verursacht werden
Teil 1: Begriffe
(IEC 555-1 (1982 - 1. Ausgabe))

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CENELEC

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

Central Secretariat: rue Bréderode 2, B-1000 Brussels

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Ref. No. EN 60 555-1:1987 E

BRIEF HISTORY

The CENELEC Questionnaire Procedure performed for finding out whether or not IEC 555-1 (first edition, 1982) could be accepted without textual changes, has shown that no common modifications were necessary for the acceptance as a European Standard (EN). The Reference Document was submitted to the CENELEC members for vote and acceptance by CENELEC.

TECHNICAL TEXT

The text of the International Standard IEC 555-1 (first edition, 1982) was approved by CENELEC on 27 February 1986 as a European Standard.

The following dates were fixed for the EN:

doa: 1986-12-01
dop/dow: 1987-06-01

Note: EN 60 555 Part 1, Part 2 and Part 3 supersedes EN 50 006.

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NORME
INTERNATIONALE
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STANDARD

CEI
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555-3

1982

MODIFICATION 1
AMENDMENT 1

1990-04

Modification 1 à la Publication 555-3 (1982)

Perturbations produites dans les réseaux d'alimentation par les appareils électrodomestiques et les équipements analogues

Troisième partie:
Fluctuations de tension

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Amendment 1 to Publication 555-3 (1982)

Disturbances in supply systems caused by household appliances and similar electrical equipment

Part 3:
Voltage fluctuations

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PREFACE

This amendment has been prepared by Sub-Committee 77A: Equipment for connection to the public low-voltage supply system, of IEC Technical Committee No. 77: Electromagnetic compatibility between electrical equipment including networks.

The text of this amendment is based on the following documents:

Six Months' Rule	Reports on the Voting
77A(C0)22 77A(C0)23	77A(C0)29 77A(C0)30

Full information on the voting for the approval of this amendment can be found in the Voting Reports indicated in the above table.

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6. Assessment of voltage fluctuations

Replace, on page 19, the text of Sub-clause 6.1 by the following:

6.1 Direct flicker measurement

All types of voltage fluctuation may be assessed by the use of a flickermeter which complies with the specification given in IEC Publication 868 using the method of evaluation given in Appendix A of IEC 555-3. The flickermeter is connected as described hereafter in Clause A4.

An appliance complies with this standard if the following conditions are met:

- the value P_{st} shall not be greater than 1;
- any single relative voltage change at the supply terminals of the appliance under test shall not exceed 3% (for motor starting requirements see 6.3).

Note.- For rectangular voltage changes, a maximum value of instantaneous flicker sensation expressed in units of perceptibility (output 5 of the flickermeter) not exceeding 30 indicates compliance with the latter requirement.

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Replace the text of Sub-clause 6.3 by the following:

6.3 Voltage changes produced by the starting of appliance motors

Non-rectangular voltage changes produced by motor starting may cause a less severe flicker effect than rectangular changes of the same amplitude.

Each motor start is to be considered as a single voltage change d (as shown in Figures 11a and 11b), the largest r.m.s. voltage change achieved during motor starting. The voltage change due to disconnection of a motor is to be considered as another voltage change.

Compliance with the requirement for motor starting may be demonstrated by any one of the following methods; in case of doubt Method I shall be used as the reference method.

Method I

The value P_{st} may be measured directly using the method described in Clause A4. The appliance complies if the conditions of Sub-clause 6.1 are met except that a single voltage change d shall not exceed 4% of the nominal voltage.

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Method II

The voltage change d is taken to be the rectangular change used in the analytical assessment in Sub-clause 6.2. The conditions of compliance shall be as stated in 6.2.

Note. - Locked rotor measurements may be used to determine the largest r.m.s. voltage change produced during motor starting. If there is no significant harmonic distortion, r.m.s. values may be derived from peak value measurements.

Method III

At the design stage of motorised equipment or if a flickermeter is not available, the acceptability of non-rectangular changes caused by the starting of motors fed via the reference impedance may be predicted by using the following procedure to obtain the equivalent rectangular voltage change d_{eq} :

- a) Find the r.m.s. voltage change d as described in Method II.

- b) Use a histogram, with successive periods of 20 ms, of the r.m.s. current or voltage drop to estimate the front and tail times (see Figure 12).

Note.- These estimates may be obtained by considering peak values.

- c) Obtain the equivalent factor F for these front and tail times from Figure 13.

Note.- When using Figure 13, tail times less than 20 ms shall be taken as 20 ms and those greater than 250 ms shall be taken as 250 ms. Similarly, front times less than 10 ms shall be taken as 10 ms and those greater than 400 ms shall be taken as 400 ms.

- d) Calculate the equivalent rectangular voltage change

$$d_{eq} = F \cdot d$$

The equivalent rectangular voltage change d_{eq} is taken to be the rectangular voltage change used in the analytical assessment in 6.2. The conditions of compliance shall be as stated in 6.2 and the largest single voltage change shall not exceed 4% of the nominal voltage.

Notes 1.- When the height of the first block of the histogram is 90% or more of the highest block, the front time is taken as 10 ms.

2.- When there is only a single 20 ms block in the histogram, both rise and tail times are taken as 10 ms.