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English version

ELECTRICAL INSTALLATIONS OF BUILDINGS
PART 4: PROTECTION FOR SAFETY
CHAPTER 43: PROTECTION AGAINST OVERCURRENT

INSTALLATIONS ELECTRIQUES DES BATIMENTS
PARTIE 4: PROTECTION POUR ASSURER LA SECURITE
CHAPITRE 43: PROTECTION CONTRE LES SURINTENSITES

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ELEKTRISCHE ANLAGEN VON GEBÄUDEN
TEIL 4: SCHUTZMASSNAHMEN
KAPITEL 43: ÜBERSTROMSCHUTZ

CENELEC

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HARMONIZATION DOCUMENT

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ENGLISH VERSION

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This document the final draft of which bore the reference CENELEC/TC 64B (SEC) 2075 (February 1978) was prepared by the Sub-Committee CENELEC/TC 64B.

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C E N E L E C
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PREFACE

1. Reference Document

The Reference Document for this Harmonization Document is the International Electrotechnical Commission Standard IEC:364-4-43, First Edition, 1977, prepared by IEC Technical Committee N° 64:Electrical installations of buildings.

IEC Publication 364: Electrical installations of buildings, is a composite publication of a number of Parts, each dealing with a particular aspect of electrical installations. Part 4 is concerned with protection for safety and within that Part, Chapter 43 specifies measures for protection against overcurrents. Other parts of the publication will deal with the selection, application and co-ordination of measures for protection against overcurrent, for the selection and erection of the appropriate electrical equipment, and for the verification of installations.

2. Scope

The Scope of this Harmonization Document is CENELEC Harmonization Document HD 384.1.

3. CENELEC Common Modifications

CENELEC Common Modifications of the Reference Document are numbered and indicated by marginal side-lining. Justifications for the common modifications are stated in Appendix I.

4. Explanations of certain requirements

Some explanations considered to be useful for interpretation of some requirements of the Reference Document text are given in Appendix II.

5. Definitions

Pending the production of an IEC Publication suitable for treatment as a Reference Document, definitions used for the development of this Harmonization Document are provided for guidance only in Appendix III.

6. Appendix IV: Chapter 53, Switchgear (Protection, isolation and switching)

Sections 531 (Common requirements) and 533 (Devices for protection against overcurrent)

The rules relating to the selection and erection of switchgear are currently being considered by IEC/TC 64. In the meantime, it has seemed necessary to give the conditions for the selection and erection of protective devices complying with the rules of Chapter 43, based on draft IEC 64(Secretariat)24

Countries are free to decide whether or not to take account of the indications thus given for the selection and erection of protective devices.

Chapter 53 will later form the subject of a harmonization document.

7. Information given in the Preface and in Appendices does not form part of Harmonization Document. The addendum to HD 384.4.43 is published separately.

43.- PROTECTION AGAINST OVERCURRENT

431.- GENERAL

431.1.- Live conductors shall be protected by one or more devices for automatic interruption of the supply in the event of overload (see Section 433) and short circuit (Section 434) except where the overcurrent is limited in accordance with Section 436. Further, protection against overload and against short circuit shall be co-ordinated in accordance with Section 435.

Notes.- 1. Live conductors protected against overload in accordance with Section 433 are considered to be protected also against faults likely to cause overcurrents of a magnitude similar to overload currents.

2. For conditions of application, see document HD 384.4.473

3. The protection of flexible cables in fixed installations is included in these rules.

(1) Flexible cables connecting equipment by plugs and sockets to fixed installations are not necessarily protected against overload ; the protection of such cables against short circuits is under consideration.

432.- NATURE OF PROTECTIVE DEVICES

The protective devices shall be chosen from among those indicated by Sub-clauses 432-1 to 432-3. standards.iteh.ai

432.1.- Devices ensuring protection against both overload current and short circuit current

These protective devices shall be capable of breaking any overcurrent up to and including the prospective short circuit current at the point where the device is installed. They shall satisfy the requirements of Section 433 and Sub-clause 434.3.1. Such protective devices may be:

- circuit breakers incorporating overload release,
- circuit breakers in conjunction with fuses.
- the following types of fuse or fuse links:
 - . gI fuses tested in accordance with IEC 269-2 and 269-3,
 - . fuses, having gII fuse links tested in a special test rig having high thermal conductivity.

Notes.- 1. The fuse comprises all the parts that form the complete protective device.

2. The testing of gII fuse links in special test rigs is under consideration.

3. The use of a protective device having a breaking capacity below the value of the prospective short circuit current at its place of installation is subject to the requirements of Sub-clause 434.3.1.

432.2.- Devices ensuring protection against overload current only

These are generally inverse-time-lag protective devices whose interrupting capacity may be below the value of the prospective short circuit current at the point where the device is installed. They shall satisfy the requirements of Section 433.

432.3.- Devices ensuring protection against short circuit current only

These devices may be installed where overload protection is achieved other means or where Document HD384.4.473 allows overload protection to be dispensed with. The devices shall be capable of breaking short circuit currents up to and including the prospective short circuit current. They shall satisfy the requirements of Section 434.

Such devices may be:

- circuit breakers with short circuit release,
- fuses.

432.4.- Characteristics of protective devices

The time/current characteristics of overcurrent protective devices shall comply with those specified in Harmonization Documents HD ... (documents under consideration, based on IEC Publications 157-1, 157-2, 269-1, 269-2, 269-3 and 292-1).

(2)

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Note.- The use of other devices is not excluded provided that their time/current characteristics provide an equivalent level of protection to that specified in this clause.

433.- PROTECTION AGAINST OVERLOAD CURRENT

433.1.- General

Protective devices shall be provided to break any overload current flowing in the circuit conductors before such a current could cause a temperature rise detrimental to insulation, joints, terminations, or surroundings of the conductors.

433.2.- Co-ordination between conductors and protective devices

The operating characteristics of a device protecting a cable against overload shall satisfy the following conditions:

- 1) $I_B \leq I_n \leq I_z$
- 2) $I_2 \leq 1.45 \cdot I_z$

I_B Design current of the circuit,

I_z Continuous current carrying capacity of the cable (see Section *)

I_n Nominal current of the protective device

Note.- For adjustable protective devices the nominal current I_n is the current setting selected.

I_2 Current assuring effective operation of the protective device. In practice I_2 is taken as equal to:

- the operating current in conventional time for circuit-breakers;
- the fusing current in conventional time for type gI fuses,
- 0.9 times the fusing current in conventional time for type gII fuses.

Notes.- 1. The factor 0.9 takes account of the influence of differences in test conditions between type gI fuses and type gII fuse links since the latter are generally tested in a conventional test rig where the cooling conditions are better.

2. Protection in accordance with this clause does not ensure complete protection in certain cases, for example against sustained overcurrents less than I_2 , nor will it necessarily result in the most economic solution. Therefore, it is assumed that the circuit is so designed that small overloads of long duration will not frequently occur.

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433.3.- Protection of conductors in parallel

When the same protective device protects several conductors in parallel, the value of I_z is the sum of the current carrying capacities of each conductor. This provision is applicable only if the conductors are arranged so as to carry substantially equal current.

- (3) Note.- In practice, this measure is acceptable only if the wiring has the same electrical characteristics (nature, method of installation, length, cross-sectional area) and has no branch circuit throughout its length. However, a verification may be suitable.

433.4.- Protection of ring final circuits

- (4) (under consideration)

434.- PROTECTION AGAINST SHORT CIRCUIT CURRENT

- (5) Note.- This document only considers the case of short circuit anticipated between conductors belonging to the same circuit.

* HD ... (in preparation)