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NSAI Standards

Standard Recommendation
S.R. CLC/TR 50480:2011

Determination of cross-sectional area of conductors and selection of protective devices

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NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W **NSAI.ie**

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 50480

February 2011

ICS 29.050

Supersedes R064-003:1998

English version

Determination of cross-sectional area of conductors and selection of protective devices

Détermination des sections des conducteurs et choix des dispositifs de protection

Festlegung von Leiterquerschnitten und Auswahl von Schutzeinrichtungen

This Technical Report was approved by CENELEC on 2011-01-02.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

This Technical Report was prepared by CENELEC Technical Committee 64, Electrical installations and protection against electric shock.

The text of the draft was circulated for voting in accordance with the Internal Regulations, Part 2, Subclause 11.4.3.3 (simple majority) and was approved by CENELEC as CLC/TR 50480 on 2011-01-13.

This Technical Report supersedes R064-003:1998.

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Introduction

The harmonised rules for the erection of electrical low voltage installations, HD 384/HD 60364, require selection, dimensioning and calculation for the components of an electrical installation.

In complex installations long and detailed calculations may be needed. The rules of HD 384/HD 60364 give the basic principles without the details necessary for an accurate application.

Computers with appropriate software enable the applicable rules for the determination of conductor cross-section area and selection of protective devices to be applied readily.

It is important that the results of such software programs are in accordance with the harmonised rules.

Therefore this Technical Report defines the different reference parameters necessary for the calculation of the cross-sectional area of the conductors and for the selection of the protective devices. It also gives the reference methods for calculation according to the different safety rules defined in the Harmonisation Documents of the series HD 384/HD 60364.

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1 Scope

This Technical Report applies to low-voltage installations with a nominal system frequency of 50 Hz in which the circuits consist of insulated conductors, cables or busbar trunking systems.

It defines the different parameters used for the calculation of the characteristics of electrical wiring systems in order to comply with rules of HD 384/HD 60364.

These rules are mainly the following:

- current-carrying capacities of the conductors;
- characteristics of protective devices in regard to protection against overcurrent;
- verification of thermal stress in conductors due to short-circuit current or earth fault current;
- fault protection (protection against indirect contact) in TN systems and IT systems;
- limitation of voltage drop;
- verification of mechanical stresses during short-circuit in busbar trunking systems (BTS) according to EN 60439-2 or powertrack systems according to EN 61534 series.

The calculations provided in this Technical Report are only applicable where the characteristics of the circuits are known.

For the purpose of this document, when referring to Busbar Trunking Systems, Powertrack Systems are also considered.

NOTE 1 Mechanical stress during short-circuit is covered by IEC 60865.

NOTE 2 In general these calculations concern supply by HV/LV transformer, but they are also applicable to supply by LV/LV transformer and LV back-up generators.

NOTE 3 Effects of harmonics currents are not covered by this document.

This Technical Report is also applicable for checking the compliance of the results of calculations performed by software programs for calculation of cross-sectional area of insulated conductors, cross-sectional area of cables and characteristics for selection of busbar trunking systems with HD 384/HD 60364.

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