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**ELECTRICAL INSTALLATION GUIDE -
SELECTION AND ERECTION OF
ELECTRICAL EQUIPMENT - WIRING
SYSTEMS - LIMITATION OF
TEMPERATURE RISE OF CONNECTING
INTERFACES**

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TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CLC/TR 50479

March 2007

ICS 13.260; 91.140.50

Supersedes R064-002:1994

English version

**Electrical installation guide -
Selection and erection of electrical equipment -
Wiring systems -
Limitation of temperature rise of connecting interfaces**

Guide pour les installations électriques -
Choix et mise en oeuvre
des matériels électriques -
Canalisations -
Limitation des échauffements
dus aux interfaces de connexion

Leitfaden für elektrische Anlagen -
Auswahl und Errichtung
elektrischer Betriebsmittel -
Kabel- und Leitungsanlagen -
Begrenzung des Temperaturanstiegs
bei Schnittstellenanschlüssen

This Technical Report was approved by CENELEC on 2006-10-09.

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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 Technical Report was prepared by SC 64B, Protection against thermal effects, of Technical Committee CENELEC TC 64, Electrical installations and protection against electric shock.

The text of the draft was submitted to a vote and was approved by CENELEC as CLC/TR 50479 on 2006-10-09.

This Technical Report supersedes R064-002:1994.

INTRODUCTION

When designing an installation or during initial verification, it is sometimes observed that the temperatures reached by interfaces between terminals and conductors are higher than those which could be withstood by insulation in normal service.

In this case, precautions shall be taken so that the temperature attained by terminals in normal service shall not impair effectiveness of the insulation of conductors connected to them or supporting them.

See HD 384.5.52 'Electrical installations of buildings – Part 5: Selection and erection of electrical equipment – Chapter 52: Wiring systems'.

52.1 General

52.1.1 Scope

This Technical Report is for use as a guide for electrical installations. It is applicable to the limitation of temperature rises of connecting interfaces.

52.1.2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 60439-1:1999, Low-voltage switchgear and controlgear assemblies - Part 1: Type-tested and partially type-tested assemblies (IEC 60439-1:1999)

EN 60439-3:1991, Low-voltage switchgear and controlgear assemblies - Part 3: Particular requirements for low-voltage switchgear and controlgear assemblies intended to be installed in places where unskilled persons have access for their use - Distribution boards (IEC 60439-3:1990, modified)

HD 384.5.523 S2:2001, Electrical installations of buildings - Part 5: Selection and erection of electrical equipment - Section 523: Current-carrying capacities in wiring systems (IEC 60364-5-523:1999, modified)

CLC/TR 60890:2002, A method of temperature-rise assessment by extrapolation for partially type-tested assemblies (PTTA) of low-voltage switchgear and controlgear (IEC 60890:1987 + corr. 1988 + A1:1995)

IEC/TR 60943:1998, Guidance concerning the permissible temperature rise for parts of electrical equipment, in particular for terminals

52.2 Maximum temperatures of terminals in normal service conditions

52.2.1 The temperature of a terminal is the sum of the ambient temperature and its temperature rise in normal service.

Product standards give conventional limit values for temperature rise under defined test conditions, but do not indicate, in general, limits for permissible temperature rises in service conditions.

Relevant standards in this respect are EN 60439-1, EN 60439-3 and CLC/TR 60890.

52.2.2 The temperatures of terminals are affected by the heat dissipated in normal service by the equipment. This heat may be caused by internal losses dissipated in the equipment and by neighbouring internal and external heat sources, if any.

The temperatures of terminals are also related to the way in which they are used, which could affect their electrical resistance and dissipation of heat.

52.2.3 Compatibility between temperatures of terminals of equipment and temperatures permitted for the insulation of the conductors and cables shall be obtained by appropriate arrangement during installation.

Clauses, subclauses	Recommendations
<p>52.3 Means for limiting temperatures of terminals in service or their effects</p>	<p>Recommendations for the choice of methods for limiting temperatures of terminals in service on their effects</p> <p>Recommendations are given below on the selection of methods according to local conditions of installation, practicability of installation, nature of equipment.</p>
<p>52.3.1 Temperatures of terminals can be limited by one or more of the following measures:</p>	
<p>52.3.1.1 Limitation of contents of enclosures (cubicles, cabinets, trunkings, conduits)</p>	<p>The limitation of contents of trunkings and conduits is recommended when a great number of circuits issue from the same panel ; in this case it is preferable to use several runs of trunking or conduit.</p>
<p>52.3.1.2 Spacing between equipment in order to improve natural ventilation</p>	<p>Spacing between adjacent equipment permits better dissipation of heat. It is necessary to refer to manufacturer's instructions. This solution is especially recommended when a great number of items of equipment are installed in the same enclosure (cubicle or cabinet).</p>
<p>52.3.1.3 Appropriate arrangement of equipment dissipating heat inside enclosures</p>	<p>It is recommended that equipment-dissipating heat is installed in an appropriate way so that the correct operation of other equipment will not be impaired. Other means, such as the interposition of screens or deflectors, may be used for this purpose.</p>
<p>52.3.1.4 Natural or forced ventilation or air-conditioning of cubicles, cabinets or locations.</p>	<p>Forced ventilation of the equipment may be necessary in specific applications, for examples to protect against ingress of dust.</p>
<p>52.3.1.5 Derating of equipment by use of equipment having higher rated current, consequently dissipating less heat.</p>	<p>Derating of equipment can be used to reduce the temperature of terminals, provided that such derating is permitted for the equipment.</p>
<p>52.3.1.6 Selection of material for enclosures of cubicles or cabinets in which terminals are installed, in order to improve the thermal dissipation.</p>	
<p>52.3.1.7 Maintenance of correct clamping of conductors in the terminals.</p>	<p>Arrangements shall be made to ensure the maintenance of clamping pressure of conductors in their terminals. Such arrangements may be built-in (for example, use of resilient connections) or result from instructions for the inspection of the installation.</p>

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