

TECHNICAL REPORT

RAPPORT TECHNIQUE

**Electrical installation guide –
Part 52: Selection and erection of electrical equipment – Wiring systems**

**Guide pour les installations électriques –
Partie 52: Choix et mise en œuvre des matériels électriques – Canalisations**



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CONTENTS

FOREWORD.....	3
520 Introduction	5
520.1 Scope	5
520.2 Normative references	5
521 Types of wiring system	6
521.6 Conduit systems, cable ducting systems, cable trunking systems, cable tray systems and cable ladder systems	6
522 Selection and erection of wiring systems in relation to external influences	7
522.4 Presence of solid foreign bodies	7
522.6 Impact	7
522.8 Other mechanical stresses	7
522.8.101 Reduction of the risk of short-circuit or earth fault.....	7
522.11 Solar radiation and ultraviolet radiation	7
523 Current-carrying capacities	8
526 Electrical connections.....	8
526.4 Maximum temperatures of terminals in normal service conditions.....	8
526.4.101 General	8
526.4.201 Limitation of temperature at a terminal.....	8
526.4.301 Limitation of the effects of temperature at a terminal in normal service	9
526.8 Connection of multiwire, fine wire and very fine wire conductors	10
528 Proximity of wiring systems to other services	10
528.2 Proximity of communication cables.....	10
Annex B, Current-carrying capacity.....	11
Annex I (informative) List of notes concerning certain countries	12
Bibliography.....	13
Table 52A – Cable surrounded by thermal insulation	11

INTERNATIONAL ELECTROTECHNICAL COMMISSION

ELECTRICAL INSTALLATION GUIDE –

**Part 52: Selection and erection of electrical equipment –
Wiring systems**

FOREWORD

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IEC 61200-52, which is a technical report, has been prepared by IEC technical committee 64: Electrical installations and protection against electric shock.

This second edition cancels and replaces the first edition, published in 1993, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) the scope has been modified; whilst the Guide does not form part of the IEC 60364 series, it serves as a supplement to IEC 60364-5-52:2009 and explains the rules so as to facilitate the design, selection, erection and maintenance of wiring systems;
- b) guidance associated with conduit systems, cable ducting systems, cable trunking systems, cable tray systems and cable ladder systems has been added giving, for example, recommended maximum straight lengths of conduit to ease the installation circuit wiring;
- c) guidance associated with selection and erection of wiring systems in relation to external influences has been extended to cover impact, and other mechanical stresses.
- d) guidance for grouping of cables has been added.
- e) guidance on maximum temperatures of terminals in normal service conditions has been extended;
- f) guidance on the connection of multi wire, fine wire and very fine wire conductors has been added;
- g) guidance on proximity of communication cables has been added;
- h) guidance on cables in contact with thermal insulation has been added.

This technical report serves as a supplement to IEC 60364-5-52:2009 and follows the numbering of that standard.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
64/1875/DTR	64/1887/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

ELECTRICAL INSTALLATION GUIDE –

Part 52: Selection and erection of electrical equipment – Wiring systems

520 Introduction

520.1 Scope

This Technical Report serves as a supplement to IEC 60364-5-52:2009 and explains the rules so as to facilitate the design, selection, erection and maintenance of wiring systems.

It is written for everyone concerned with the design, the selection and supply of equipment, as well as the persons who install, maintain and use electrical installations.

520.2 Normative references

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

IEC 60227-4, *Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V – Part 4: Sheathed cables for fixed wiring*

IEC 60245-4, *Rubber insulated cables – Rated voltages up to and including 450/750 V – Part 4: Cords and flexible cables*

IEC 60364-4-43:2008, *Low-voltage electrical installations – Part 4-43 Protection for safety – Protection against overcurrent*

IEC 60364-5-51:2005, *Electrical installations of buildings – Part 5-51: Selection and erection of electrical equipment – Common rules*

IEC 60364-5-52:2009, *Low-voltage electrical installations – Part 5-52: Selection and erection of electrical equipment – Wiring systems*

IEC 60502-1, *Power cables with extruded insulation and their accessories for rated voltages from 1 kV ($U_m = 1,2$ kV) up to 30 kV ($U_m = 36$ kV) – Part 1: Cables for rated voltages of 1 kV ($U_m = 1,2$ kV) and 3 kV ($U_m = 3,6$ kV)*

IEC/TR 60890, *A method of temperature-rise assessment by extrapolation for partially type-tested assemblies (PTTA) of low-voltage switchgear and controlgear*

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

IEC 61084 (all parts), *Cable trunking and ducting systems for electrical installations*

IEC 61084-2-2, *Cable trunking and ducting systems for electrical installations – Part 2-2: Particular requirements – Cable trunking systems and cable ducting systems intended for underfloor and flushfloor installations*

IEC 61386 (all parts), *Conduit systems for cable management*

IEC 61386-21, *Conduit systems for cable management – Part 21: Particular requirements – Rigid conduit systems*

IEC 61386-22, *Conduit systems for cable management – Part 22: Particular requirements – Pliable conduit systems*

IEC 61386-23, *Conduit systems for cable management – Part 23: Particular requirements – Flexible conduit systems*

IEC 61439 (all parts), *Low-voltage switchgear and controlgear assemblies*

521 Types of wiring system

521.6 Conduit systems, cable ducting systems, cable trunking systems, cable tray systems and cable ladder systems

The following includes recommendations to ease the installation, or replacement, of circuits installed in conduit.

- a) Straight conduit lengths between access points should not exceed 25 m. Conduit lengths which include changes in direction should not exceed 15 m between access points. There should be no more than three changes in direction between access points.
- b) The number of bends in any run should be minimized.
- c) Any bending radius should be as large as possible and in accordance with the manufacturer's instructions.
- d) The cables or insulated conductors should not occupy more than one-third of the total internal cross-sectional area of the conduit.
- e) Conduit systems should be installed so as to minimize the mechanical stress on the conduit.
- f) If conduit systems are to be installed outdoors, consideration should be given to the ambient temperature and effects of solar radiation as indicated in 522.1 and 522.11.
- g) Where self-recovering conduit has to be embedded in concrete, consideration should be given to the possibility of permanent deformation of the cross-section of the conduit that might result in damage to the enclosed cables or insulated conductors. Where necessary, measures should be taken such as additional mechanical protection or the use of conduit having suitably increased diameter or resistance to compression.

When electrical accessories are mounted in trunking or ducting systems that are installed in or under a floor, the type of floor treatment likely to be used (wet or dry) should be taken into consideration.

Where cable trunking systems are installed in a skirting position (e.g. Item 6 of Table A52.3 of IEC 60364-5-52:2009), damage caused by the ingress of water can be avoided by placing the insulated conductors laid within at least 10 mm above the floor level.

Cable trunking systems and cable ducting systems intended for underfloor and flush floor installations are covered by IEC 61084-2-2.

Where cable tray systems are used, the use of a cover can also be necessary, for example for mechanical protection or design reasons or preventing access (e.g. in the basin of public fountains).