Australian/New Zealand Standard™

Electrical installations—Selection of cables

Part 1.1: Cables for alternating voltages up to and including 0.6/1 kV—Typical Australian installation conditions

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-001, Wiring Rules. It was approved on behalf of the Council of Standards Australia on 14 September 2009 and on behalf of the Council of Standards New Zealand on 2 October 2009.
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The following are represented on Committee EL-001:

Association of Consulting Engineers Australia
Australian Building Codes Board
Australian Industry Group
Communications, Electrical and Plumbing Union
Consumers' Federation of Australia
Electrical and Communications Association (Qld)
Electrical Contractors Association of New Zealand
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AS/NZS 3008.1.1:2009
(Incorporating Amendment No. 1)

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-001, Wiring Rules, to supersede AS/NZS 3008.1.1:1998, *Electrical installations—Selection of cables*, Part 1.1 *Cables for alternating voltages up to and including 0.6/1 kV—Typical Australian installation conditions*.

This Standard incorporates Amendment No. 1 (August 2011). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

This Standard is applicable to Australian installation conditions where the nominal ambient air and soil temperatures are 40°C and 25°C, respectively. Part 1.2 is applicable to New Zealand installation conditions where the nominal air and soil temperatures are 30°C and 15°C respectively. Each Part is a complete Standard and requires no reference to the other.

Part 2 will deal with cables for use with alternating voltages over 1 kV.

The objective of the Standard is to specify current-carrying capacity, voltage drop and short-circuit temperature rise of cables, to provide a method of selection for those types of electric cables and methods of installation that are in common use at working voltages up to and including 0.6/1 kV at 50 Hz a.c.

This Standard differs from the 1998 edition as follows:

(a) The limitations of the installation of thermoplastic insulated cables have been further clarified.

(b) An explanation has been provided regarding the properties of cross-linked materials at higher temperatures.

(c) Information has been included on the effect of harmonic currents on balanced three-phase systems, the effect of parallel cables and the effect of electromagnetic interference.

(d) Ratings for cables with flexible conductors and cables exposed to the sun have been extended in the tables of current-carrying capacities.

(e) Thermoplastic insulated cables with temperature ratings of 90°C and 105°C have been included in the tables covering current-carrying capacities of cables with 90°C rated cross-linked insulation materials.

(f) For cables with conductor sizes up to 10 mm^2 the values of current-carrying capacities for installation in underground wiring enclosures have also been used for the situation of installations ‘buried direct’.

(g) Current-carrying capacities for cables installed in wiring enclosures have been recalculated according to IEC 60287.

(h) The values for all current-carrying capacities have been expressed to the nearest ampere to align with current IEC practice.

(i) Additional values for a.c. resistance and three-phase voltage drop have been included for single-core aerial cables with bare or insulated conductors operating at a conductor temperature of 80°C.

(j) Table headings have been simplified and now listed in an Appendix for ease of reference.

In the preparation of this Standard, reference was made to IEC 60287 and acknowledgment is made of the assistance received from that source.

Statements expressed in mandatory terms in notes to tables and figures are deemed to be requirements of this Standard.

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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SECTION 1 SCOPE AND APPLICATION

1.1 SCOPE

This Standard sets out a method for cable selection for those types of electrical cables and methods of installation that are in common use at working voltages up to and including 0.6/1 kV at 50 Hz a.c.

Three criteria are given for cable selection, as follows:

(a) Current-carrying capacity.

(b) Voltage drop.

(c) Short-circuit temperature rise.

This Standard provides sustained current-carrying capacities and voltage drop values for those types of electrical cable and installation practices in common use in Australia. A significant amount of explanatory material is also provided on the application of rating factors that arise from the particular installation conditions of a single circuit or groups of circuits. Also, provided in Section 5 is information on cable selection based on short-circuit temperature limits.

NOTE: A number of worked examples on cable selection are included in Appendix A.

This Standard does not take into account the effects that may occur owing to temperature rise at the terminals of equipment and reference is necessary to AS/NZS 3000 and the individual equipment Standards.

NOTE: For ease of reference, an index of the Tables included in this Standard is provided in Appendix B.

1.2 APPLICATION

This Standard is intended to apply to installations made or carried out after the date of publication, but it is recommended that it not be applied on a mandatory basis until 6 months after the date of publication. However, if work on an installation commenced before publication of this edition, the inspecting authority may grant permission for the installation to be carried out in accordance with the superseded edition.