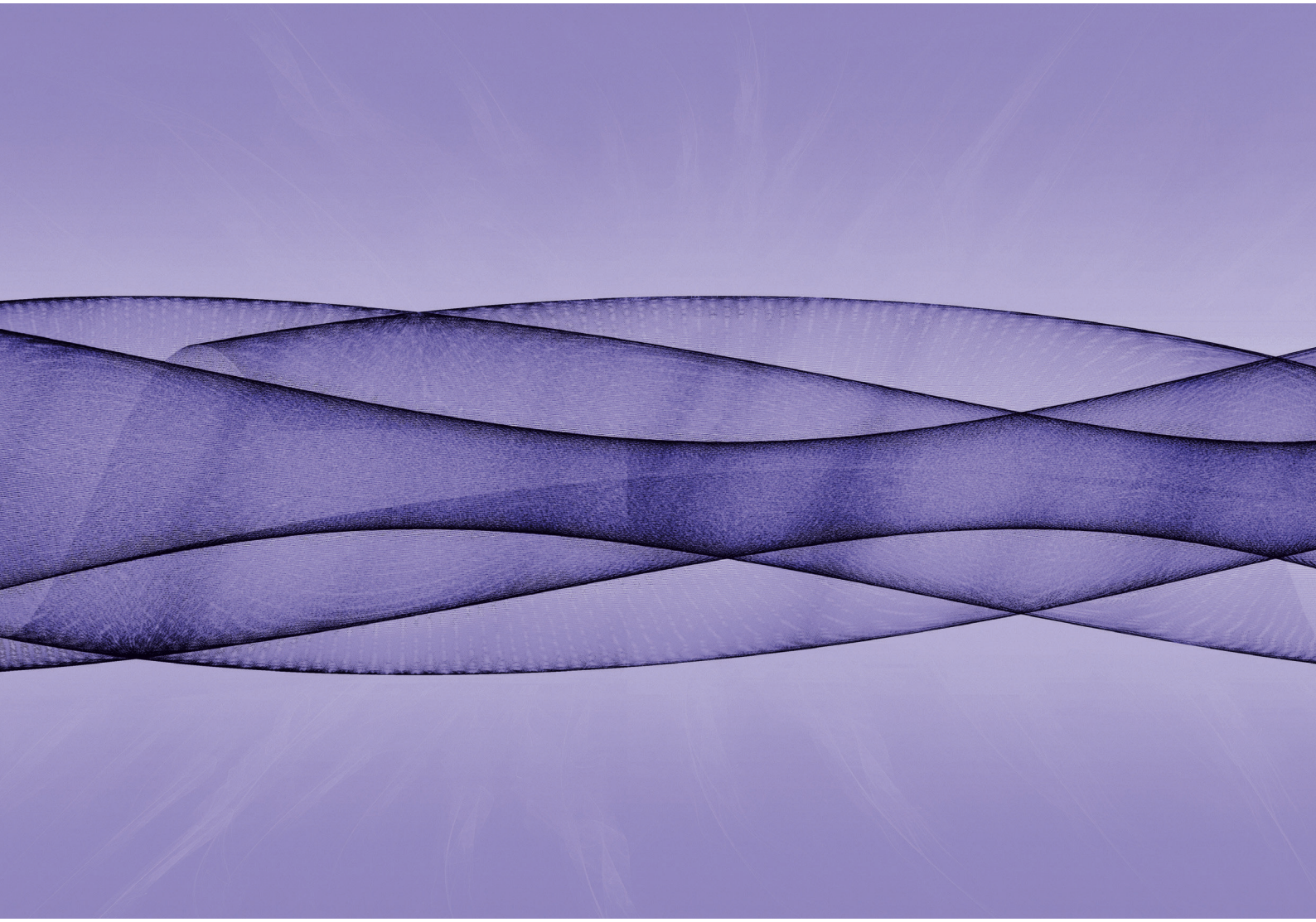
AS/NZS 3000:2018
(Incorporating Amendment No. 1)

Electrical installations
"Wiring Rules"



STANDARDS Australia

STANDARDS NEW ZEALAND
PAEREWA AOTEAROA

Wiring Rules

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 5 June 2018 and by the New Zealand Standards Approval Board on 3 April 2018.
This Standard was published on 26 June 2018.

The following are represented on Committee EL-001:

Australian Building Codes Board
Australian Energy Council
Australian Industry Group
Communications, Electrical and Plumbing Union - Electrical Division
Consumer New Zealand
Consumers Federation of Australia
Electrical Contractors Association of New Zealand
Electrical Regulatory Authorities Council
Electrical Safety New Zealand
Electrical Workers Registration Board
ElectroComms & Energy Utilities Industries Skills Council
Energy Efficiency & Conservation Authority of New Zealand
Energy Networks Australia
Engineers Australia
Institute of Electrical Inspectors
Master Electricians Australia
National Electrical and Communications Association
National Electrical Switchboard Manufacturers Association
New Zealand Manufacturers and Exporters Association
NSW Department of Industry, Skills and Regional Development
Wellington Electrical Association
WorkSafe New Zealand

Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Australia website at www.standards.org.au or Standards New Zealand web site at www.standards.govt.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of Standards Australia or the New Zealand Standards Executive at the address shown on the back cover.

This Standard was issued in draft form for comment as DR AS/NZS 3000:2016.

AS/NZS 3000:2018
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

Electrical installations (known as the Australian/New Zealand Wiring Rules)

Originated as part of AS CC1—1931.
Previous edition AS/NZS 3000:2007.
Sixth edition 2018.
Reissued incorporating Amendment No. 1 (January 2020).

ISBN 978 1 76035 993 5

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-001, Wiring Rules, to supersede AS/NZS 3000:2007, *Electrical installations (known as the Australian/ New Zealand Wiring Rules)*.

This Standard incorporates Amendment No. 1 (January 2020). 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.

The development of this edition was based on—

(a) new technology, new equipment and improved installation techniques;

(b) industry feedback regarding readability and compliance;

(c) identification and clarification of normative (mandatory) requirements and informative guidance material throughout the document; and

(d) experience gained in the application of the previous edition as expressed to Standards Australia and Standards New Zealand.

This Standard may be applied through legislative requirements, as indicated in Clause 1.2. This Standard supersedes AS/NZS 3000:2007 from its date of publication. This may not be practicable in some cases, and a transition period, e.g. 6 months, may need to be arranged. For example, where work on an installation was commenced before publication of this edition, the relevant regulatory authority or electricity distributor should be consulted regarding permission for the installation to be completed in accordance with AS/NZS 3000:2007.

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.

See Foreword for information on how to interpret and use this Standard.

This Standard comprises two parts, as set out below, with both parts bound as one document.

Part 1 provides uniform essential elements that constitute the minimum regulatory requirements for a safe electrical installation.

Part 1 also provides an alternative regulatory vehicle for Australian and New Zealand regulators seeking to move from the present prescription of AS/NZS 3000 in electrical installation safety and licensing legislation.

Part 1 satisfies the following objectives:

- To allow its content to be called up in regulation as a separate Part or together with Part 2.

- To be generally complete in itself to avoid cross-referencing to Part 2.
- To provide high level safety performance outcomes/conditions without prescriptive work methods that demonstrate means of compliance (which are in Part 2).
- To establish an enforcement link to Part 2. Failure to comply with a work method in Part 2 would breach the requirements of Part 1 unless an alternative method is used.
- To establish the 'deemed to comply' status of Part 2, confirming that installations that comply with Part 2 comply with the requirements of Part 1.
- To maintain alignment with IEC 60364, *Low voltage electrical installations* (series), developments at the level of essential safety.
- To provide a mechanism for acceptance of alternative design and installation practices that are not addressed in, or are inconsistent with those given in the 'deemed to comply' Part 2. This mechanism is intended to apply where departures from the methods in Part 2 are significant rather than minor aspects that remain within the flexibility of Part 2.
- To detail requirements for designers or installers seeking to apply an alternative method to the 'deemed to comply' methods contained in Part 2.

Part 2 provides installation practices that are deemed to comply with the essential safety requirements of Part 1.

Part 2 satisfies the following objectives:

- To allow it to be called up in regulation, in addition to Part 1, to reflect a range of regulatory adoption options.
- To incorporate and elaborate on all requirements of Part 1 with additional requirements and recommendations to clarify and support compliance.
- To restore certain requirements, recommendations and examples of typical, effective compliant solutions from previous editions.
- To emphasize common, practicable and cost-effective methods that achieve safety compliance, fitness for purpose and a level of good practice rather than overly conservative or obscure measures.
- To make greater use of figures and examples to promote understanding of common or difficult aspects, e.g. line diagrams, alternative overcurrent device locations, ingress protection (IP) rating and switchboard access.

Changes in this edition

An asterisk (*) in the left margin against a clause, table or figure indicates where significant changes have been made in this edition of the Standard.

Changes to AS/NZS 3000:2007 include the following:

Section 1:

1 New and revised definitions are indicated in Clause 1.4 by an asterisk (*) in the left margin.

2 The definition of mains supply has been removed.

3 ‘Direct contact’ and ‘indirect contact’ are now designated ‘basic protection’ and ‘fault protection’.

4 IP ratings revised to suit local environmental conditions.

5 Requirements for conductors with green/yellow insulation are specified.

6 References to AS/NZS 3018 have been replaced with references to other Standards.

7 Requirements for alterations and repairs have been clarified and expanded.

8 New Part 1 solutions have been added along with details on where they may be used.

Section 2:

1 Operating characteristics of switchgear, control gear and switchboards have been added.

2 Origin requirements of sub-mains and final subcircuits have been added.

3 Requirements for main switch operations have been added.

4 Positions of overload protective devices have been clarified.

5 Requirements for alternate positions of short circuit protective devices have been updated.

6 Discrimination/selectivity of protective devices have been expanded.

7 Protection requirements for switchboard internal arcing faults have been enhanced.

8 Requirements for RCD protected circuits in domestic, non-domestic, non-residential and medical installations have been added, and RCD requirements for alterations and repairs clarified.

9 Illustration of basic clearances for switchboard access has been updated.

10 New clause on arc fault detection devices and their installation requirements has been added.

11 Requirements for switchboard installations at 800 A or greater have been enhanced, including access and egress, switchroom door sizes and minimum clearances around switchboards in switchrooms.

12 Further clarification has been provided regarding rising mains tee-offs.

Section 3:

1 Improved installation safety requirements for cables that pass through bulk thermal insulation.

2 Colour identification of active, neutral and earth conductors further clarified.

3 Requirements for wiring systems installed in positions where they are likely to be disturbed have been clarified.

4 Requirements have been clarified for cables of different electrical installations in common enclosures and for segregation of cables.

5 Requirements for segregation of cables of different voltage levels have been clarified.

Section 4:

1 Revised figures identify where IP rated equipment is to be installed.

2 The requirements for installation wiring connected via an installation coupler have been revised.

3 Electric vehicle socket-outlet requirements now included.

4 Requirements for lighting equipment and accessories have been revised.

5 Requirements for the safe installation of recessed luminaires have been enhanced, and an updated list of luminaire classifications added.

6 Requirements for cooking appliance switching devices clarified for improved safety outcomes.

7 Gas appliances and equipment isolation requirements clarified.

8 Further clarification of isolator requirements for airconditioning and heat pump systems.

9 A new clause and figures have been added relating to electrical equipment installed in locations requiring protection from the weather.

10 Installation and location requirements for socket-outlets for electric vehicle charging stations have been added.

11 Clearance requirements for socket-outlets and switches from open gas or electric cooking appliances have been added.

12 Requirements for isolating switches to be installed adjacent to all fixed
A1 wired water heaters have been added. Application of Clause 4.8 has been clarified.

13 Requirements on hazardous areas presented by gas relief vent terminals have been added.

14 Requirements for airconditioners and heat pumps where the internal unit (or units) are supplied from a switchboard or circuit separate to that of the compressor, and new exceptions have been added.

15 Requirements for lifts installed for general use and that are not emergency lifts (safety services) have been added.

A1 16 A warning about possible adverse effects of air extract systems has been added.

Section 5:

1 MEN system further defined for clarity.

2 MEN connection requirements have been added regarding location in an accessible position.

3 Acceptable earth electrodes types have been updated.

4 Earthing requirements for SELV and PELV systems have been updated.

5 Equipotential bonding requirements have been expanded and clarified through enhanced requirements for showers, bathrooms, pools and spas.

6 Earthing of conductive building materials in combined outbuildings.

7 Earthing requirements for individual outbuildings and combined outbuildings.

8 Earthing requirements for conductive switchboard enclosures associated with unprotected consumer mains.

9 Earthing of conductive reinforcing in combined outbuildings that contain showers or baths.

10 Conductive pool structures and the bonding connection point required to be installed and bonded to the installation earthing system regardless of other specified requirements.

11 Figure showing bonding arrangements for pools and spas has been added.

12 Requirements on conductive fixtures and fittings installed within arm's reach of the pool edge, and that are in contact with the general mass of earth, either directly or indirectly, have been added.

Section 6:

1 Additional content applying to water containers into which persons do not normally put a part or all of their body.

2 Installation requirements for deluge showers have been clarified.

3 Showers Zone 1 has been clarified for different shower head configurations.

4 Fixed water container size reduced from 45 L to 40 L.

5 A figure for showers with a hinged door has been included.

6 Specified capacity for spa pools or tubs has been increased from 500 L to 680 L.

7 Electricity generation systems, including inverters have been excluded from being installed in classified zones.

8 Clause excluding pools and spas from being located in areas containing electrical equipment owned by the electricity distributor, that result in such electrical equipment being incorporated into any classified zone.

Section 7:

1 Clause 7.2, Safety services, has been restructured.

2 Installation requirements for electricity generation systems have been reviewed and clarified in line with applicable Standards.

3 Electric vehicle charging system requirements have been added.

4 Clause 7.8, Standards for specific electrical installations, has been revised.

Section 8:

1 A number of clauses split into subclauses to differentiate between general, application, visual inspection, test requirements and accepted values.

2 Extra low voltage installation testing requirements have been relocated to Section 8 from Section 7.

3 Clarification of RCD testing and EFLI testing.

4 The date of initial energization is now required to be recorded at the installation switchboard.

Appendices:

1 Appendix A—Now a single list of referenced Standards.

2 Appendix B—Table from FAQ34 (voltage drop and EFLI values comparison) added for further guidance.