AS/NZS 3003:2018
(Incorporating Amendment No. 1)

AS/NZS 3003:2018

Australian/New Zealand Standard™

Electrical installations—Patient areas

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee HT-021, Wiring of Medical Treatment Areas in Hospitals. It was approved on behalf of the Council of Standards Australia on 16 February 2018 and by the New Zealand Standards Approval Board on 5 March 2018.
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The following are represented on Committee HT-021:

Aged and Community Services Australia
Australian Healthcare and Hospitals Association
Australian Industry Group
Biomedical Engineering Advisory Group SA
Canterbury District Health Board
Construction Services Branch, ACT Government
Consumers Federation of Australia
Day Hospitals Australia
Electrical Regulatory Authorities Council
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Institute of Electrical Inspectors
Institute of Healthcare Engineering Australia
Institution of Professional Engineers New Zealand
National Electrical and Communications Association
New Zealand Institute of Health and Engineering
NSW Health
Waitemata District Health Board
Worksafe New Zealand

Additional Interests:

Australian Private Hospitals Association
Medical Technology Association of Australia

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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.

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Electrical installations—Patient areas

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee HT-021, Wiring of Medical Treatment Areas in Hospitals, to supersede AS/NZS 3003:2011, *Electrical installations—Patient areas*.

This Standard incorporates Amendment No. 1 (July 2019). 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 objective of this Standard is to specify particular requirements for electrical installations in patient areas. These requirements are additional to those specified in AS/NZS 3000 and the New Zealand *Electricity (Safety) Regulations 2010*.

A This Standard may be applied through legislative requirements. This Standard supersedes AS/NZS 3003:2011 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 3003:2011.

NZ Conformance with this Standard is deemed to be in accordance with AS/NZS 3003:2011.

New Zealand has formally consulted on the adoption of IEC 60364-7-710 and determined that the continued use of AS/NZS 3003 is the appropriate option for New Zealand.

NOTE: Refer to Report to Energy Safety, Ministry of Economic Development on New Zealand Electro-medical Area Regulation—Future options—From Standards New Zealand.

Any requirements that may be applicable only in Australia or New Zealand are indicated by the symbol **A** or **NZ** in the margin.

It is recommended that the responsible organization/entity carefully evaluate the procedures undertaken within existing installations and take steps to implement the appropriate electrical safety requirements specified in this Standard for areas that are used for cardiac-type procedures, or for procedures involving the regular use of medical electrical equipment.

Major changes in this edition include the following:

- The decisions made by the responsible organization/entity in determining patient areas need to be based on the classification of the medical procedures undertaken in each area.
- The word ‘point’ has been defined.
- The term ‘Responsible organization/entity’ has been defined.
- The term ‘electrical equipment’ has replaced the term ‘appliance’.
- The word ‘identification’ has replaced the word ‘marking’.
- The word ‘confirm’ has replaced the words ‘verified’ and ‘checked’.
- The term ‘testing and verification’ has replaced the term ‘testing and commissioning’.
- Exceptions have been included throughout this Standard.
- The responsible organization/entity is required to provide documentation outlining patient area locations and classifications.
- Patient area boundaries have been clarified in Figure 4.

- The patient areas, as determined by the responsible organization/entity, in any facility, building, institution or medical practice not wired as cardiac-protected electrical areas are required to be wired as body-protected electrical areas.
- Separation of circuits in cardiac-protected electrical areas has been clarified.
- A clause on extra-low-voltage charging sockets (including USB) has been added, see Clause 2.4.3.1.2.
- The distance required for socket-outlets within the entrance to a body-protected electrical area has been reduced to 2.0 m.
- Access to RCD controls and indicators is clarified in Table 2.1.
- Additional requirements have been included for socket-outlet labelling.
- Additional requirements have been included for socket-outlets requiring isolation switches.
- Additional requirements have been included for identification of socket-outlets protected by LPDs.
- Equipotential earthing terminals have been clarified.
- Equipotential earthing system requirements for nodes connected to the EP junction are now reflected in Figure 8.
- EP test terminals have been clarified.
- EP conductor labelling has been clarified.
- Where fixed electrical equipment rated at or above 2.0 kW is to be installed in a body-protected or cardiac-protected electrical area, the entire patient area is required to conform with this Standard.
- A clause on disability and aged care has been added, see Clause 5.3.
- A clause on reclassification of existing cardiac-protected electrical areas as body-protected electrical areas has been added, see Clause 6.2.5.3.
- Repairs within patient areas not wired as cardiac-protected or body-protected electrical areas in most cases will trigger upgrading to be in accordance with this Standard.
- An identification clause on alterations and additions within a patient area has been added, see Clause 6.2.5.
- Section 7 is now ‘Identification of patient areas’.
- Section 8 is now ‘Routine inspection and testing of cardiac and body-protected electrical areas’.
- Provisions for magnetic fields are now informative and located in Appendix H.
- Revised guidance tables have been included to illustrate requirements.

The terms ‘normative’ and ‘informative’ are used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of the Standard whereas an ‘informative’ appendix is only for information and guidance.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out the requirements for areas in new electrical installations and for alterations and repairs of patient areas in existing electrical installations where the organization/entity responsible for that electrical installation has determined that low-voltage medical electrical equipment will be used on a patient. It covers special patient areas, including homecare installations and transportable vehicles. It also contains requirements for identification, inspection and testing of patient areas.

1.2 GENERAL

Electrical installations in patient areas shall be carried out in accordance with AS/NZS 3000, except as varied herein, and with the additional requirements of this Standard.

The decisions made by the responsible organization/entity in determining classification of patient areas need to be based on the medical procedures undertaken in each area. Advice on whether particular patient areas should be wired as body-protected or cardiac-protected electrical areas is specified in AS/NZS 2500. The responsible organization/entity should refer to the safe practice code in AS/NZS 2500 for advice on how these decisions should be based on the type of procedures undertaken in each area and the level of protection against electric shock afforded in the medical electrical equipment available for these procedures.

While this Standard is intended to apply to new installations or extensions, some guidance is given concerning conversion of older installations.

Areas other than patient areas are not covered by this Standard, but are covered by the relevant requirements of AS/NZS 3000.

Requirements for mobile trolleys supporting electrical equipment are given in AS/NZS 3551.

Requirements for emergency lighting are given in AS/NZS 2293.1.

Requirements for emergency power systems in hospitals are given in AS/NZS 3009.

NZ In New Zealand, mobile medical connectable installations shall be in accordance with the requirements of this Standard and NZS 6115.

This Standard nominates specific maximum values of electromagnetic interference. This matter needs careful consideration at the design stage. In some patient areas, these values need to be measured.

NOTE: See Section 6 for alterations to equipotential earthing in existing installations.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1319 Safety signs for the occupational environment

3011 Electrical installations—Secondary batteries installed in buildings
3011.1 Part 1: Vented cells
3011.2 Part 2: Sealed cells

AS/NZS
1125 Conductors in insulated electric cables and flexible cords

2293 Emergency evacuation lighting for buildings
2293.1 Part 1: System design, installation and operation

2500 Guide to the safe use of electricity in patient care

3000 Electrical installations (known as the Australian/New Zealand wiring rules)

3008 Electrical installations—Selection of cables
3008.1.1 Part 1.1: Cables for alternating voltages up to and including 0.6/1 kV—Typical Australian installation conditions
3008.1.2 Part 1.2: Cables for alternating voltages up to and including 0.6/1 kV—Typical New Zealand conditions

3009 Electric installations—Emergency power supplies in hospitals

3100 Approval and test specification—General requirements for electrical equipment

3111 Approval and test specification—Miniature overcurrent circuit-breakers

3112 Approval and test specification—Plugs and socket-outlets

3120 Approval and test specification—Cord extension sockets

3123 Approval and test specification—Plugs, socket-outlets and couplers for general industrial application

3190 Approval and test specification—Residual current devices (current-operated earth-leakage devices)

3551 Management programs for medical devices

4510 Isolated electrical supply systems for medical use

5000 Electric cables—Polymeric insulated
5000.1 Part 1: For working voltages up to and including 0.6/1 (1.2) kV

60320 Appliance couplers for household and similar general purposes
60320.1 Part 1: General requirements (IEC 60320-1, Ed. 2.1 (2007) MOD)

60884 Plugs and socket-outlets for household and similar purposes
60884.1 Part 1: General requirements (IEC 60884-1, Ed. 3.1 (2006) MOD)

60898 Electrical accessories—Circuit-breakers for overcurrent protection for household and similar installations
60898.1 Part 1: Circuit-breakers for a.c. operation (IEC 60898-1, Ed. 1.2 (2003) MOD)

61008 Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)
61008.1 Part 1: General rules (IEC 61008-1, Ed. 3.2 (2013) MOD)
61009 Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs)
61009.1 Part 1: General rules (IEC 61009-1, Ed. 3.2 (2013) MOD)

AS/NZS IEC
60601 Medical electrical equipment
60601.1 Part 1: General requirements for basic safety and essential performance

NZS
6115 Electrical installations—Mobile electro-medical connectable installations

IEC
60309 Plugs, socket-outlets and couplers for industrial purposes (series)
60309-1 Part 1: General requirements
60309-2 Part 2: Dimensional interchangeability requirements for pin and contact-tube accessories
60309-4 Part 4: Switched socket-outlets and connectors with or without interlock

61557 Electrical safety in low-voltage distribution systems up to 1 000 V a.c. and 1 500 V d.c.—Equipment for testing, measuring or monitoring of protective measures
61557-6 Part 6: Effectiveness of residual current devices (RCD) in TT, TN and IT systems

New Zealand Government
Electricity (Safety) Regulations 2010

1.4 ACRONYMS

AC Alternating current

ARTG Australian Register of Therapeutic Goods

CB Circuit breaker

CCU Coronary care unit

CT Computerised tomography

DB Distribution switchboard

DC Direct current

EEG Electroencephalogram

ELV Extra-low-voltage

EMG Electromyography

ENG Electronystagmography

EP Equipotential junction

ICU Intensive care unit

LIM Line isolation monitor

LIOM Line isolation overload monitor

LPD Leakage protective device

LV Low voltage

MCB Miniature circuit breaker

ME Medical electrical

MRI Magnetic resonance imaging

PHC Prospective hazard current

PSOA Portable socket-outlet assembly

RCBO Residual current operated circuit breakers with integral overcurrent protection

RCD Residual current device

SRCD Socket-outlet residual current device

UPS Uninterruptable power supply

USB Universal serial bus

1.5 DEFINITIONS

For the purpose of this Standard, the definitions in AS/NZS 3000 and the following apply.

1.5.1 Accessible

Capable of being reached for inspection, maintenance or repairs but does not include the destructive dismantling of structural components.

1.5.2 Applied part

Part of medical electrical (ME) equipment that in normal use necessarily comes into physical contact with the patient for ME equipment or an ME system to perform its function.

[Ref: AS/NZS IEC 60601.1]

NOTES:

1 AS/NZS IEC 60601.1—

(a) classifies ‘applied part’ as Type B, Type BF or Type CF depending on the degree of protection against electric shock; and

(b) requires the equipment to be identified to indicate this classification and whether the applied part is defibrillator-proof, as shown in Figure 1.

2 In some medical electrical equipment, one symbol may appear on the equipment to indicate that all applied parts are of the same classification. For equipment with applied parts of different classifications, the appropriate symbol will appear on each applied part or near the point at which the applied part is connected to the equipment, e.g. an ECG patient cable connector.

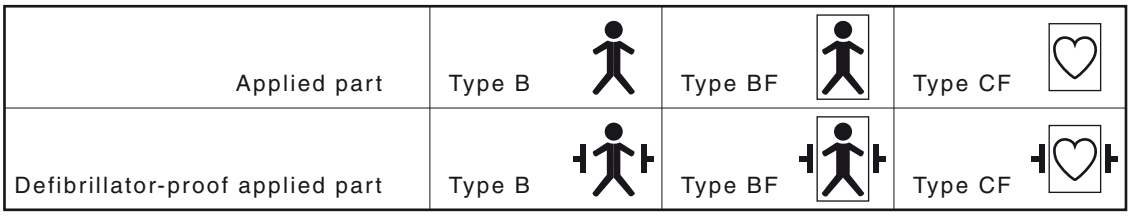

FIGURE 1 IDENTIFICATION OF APPLIED PARTS OF MEDICAL ELECTRICAL EQUIPMENT

1.5.3 Body-protected electrical area

A patient area where the electrical wiring system has been installed to enable body type procedures to be safely performed.

NOTE: A body-protected electrical areas may contain one or more patient locations.

1.5.4 Body-type procedure

Any medical procedure where there is no intention of electrical connection to the left or right ventricle of the heart.

NOTE: Refer to AS/NZS 2500 for guidance.