STANDARDS NEW ZEALAND
PAEREWA AOTEAROA

AS/NZS 3760:2010
Incorporating Amendments No. 1 and No. 2

Joint Australian New Zealand Standard

In-service safety inspection and testing of electrical equipment

Superseding AS/NZS 3760:2003

AS/NZS 3760:2010

STANDARDS Australia

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-036 – In-service testing of electrical equipment. It was approved on behalf of the Council of Standards Australia on 2 September 2010 and by the Council of Standards New Zealand on 24 September 2010. It was published on 30 September 2010.

Amendment No. 1, a correction amendment, was approved for publication in Australia by the Standards Council of Australia on 13 April 2011, and for publication in New Zealand by the Acting Minister of Energy and Resources on 15 April 2011, and on behalf of the Standards Council of New Zealand on 19 April 2011.

Amendment No. 2, a correction amendment, was approved for publication in Australia by the Standards Council of Australia on 4 December 2012, and for publication in New Zealand by the Minister of Energy and Resources on 29 November 2012, and on behalf of the Standards Council of New Zealand on 30 November 2012. It was published on 21 December 2012.

The following interests are represented on Committee EL-036:

Australian Chamber of Commerce and Industry
Australian Industry Group (AIG)
Australasian Lighting Industry Association
Building Service Contractors of New Zealand (Inc.)
Consulting Interests Australia
Consulting Interests New Zealand
Consumer Electronic Suppliers Association
Department of Labour New Zealand
Department Fair Trading, New South Wales Consumer Protection Agency
ElectroTechnical Association Inc.
Energy Safe Victoria
Hire and Rental Association Australian
Hire Industry Association of New Zealand
Housing Industry Association Australia
Institute of Electrical Inspectors Australia
Joint Accreditation System of Australia and New Zealand (JAS-ANZ)
Ministry of Economic Development New Zealand
National Electrical and Communications Association Australia
New Zealand Electric Fence Energizers Manufacturers Standards Working Group
New Zealand Council of Elders
Safety Institute of Australia
Schneider Electric Limited New Zealand
WorkCover New South Wales

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 webshop at www.standards.org.au or Standards New Zealand's website at www.standards.co.nz.

Alternatively, Standards Australia publishes an annual printed Catalogue with full details of all current Standards. 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 organisation.

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 either Standards Australia or Standards New Zealand at the address shown on the title page.

ISBN (Print) 978-1-86975-618-5
ISBN (PDF) 978-1-86975-619-2

AS/NZS 3760:2010
Incorporating Amendments No. 1 and No. 2

In-service safety inspection and testing of electrical equipment

Edition 1 AS 3760:1990
Edition 2 AS/NZS 3760:1996
Edition 3 AS/NZS 3760:2000
Edition 4 AS/NZS 3760:2001
Edition 5 AS/NZS 3760:2003
Edition 6 AS/NZS 3760:2010
Reissued incorporating Amendment No. 1 (April 2011)
Reissued incorporating Amendment No. 2 (December 2012)

CONTENTS

Referenced documents 3

Amd 2 Dec '12 | Foreword 4

Outcome statement 4

SECTION 1 – SCOPE AND GENERAL

1.1 Scope 5

1.2 General 6

1.3 Interpretation 8

1.4 Definitions 8

SECTION 2 – INSPECTION AND TESTS

2 General 13

2.1 Frequency of inspection and tests 13

2.2 Personnel 14

Amd 2 Dec '12 | 2.3 Inspection and testing 14

2.4 Action resulting from inspection and testing 18

2.5 Documentation 19

APPENDICES

A Background (Informative) 22

B Guidelines on the electrical knowledge of a competent person (Informative) 24

C Polarity for cord sets and cord extension sets (Normative) 25

D Test of earthing continuity (Normative) 28

Amd 2 Dec '12 | E Insulation testing (Normative) 30

F Insulation resistance testing of portable isolating transformers (Normative) 35

G Insulation resistance testing of a power supply (Normative) 38

H Test for the operating time of residual current devices (RCDs) (Normative) 40

J Arc welders (Informative) 42

Amd 1 Apr '11 | K Regulatory application of this Standard (Informative) 43

TABLES

1 Leakage current limits 16

2 Insulation resistance limits 16

3 Maximum tripping times 17

4 Indicative testing and inspection intervals for electrical equipment 20

C1 Conductor colours for flexible cords 26

C2 Colour schemes of conductor insulation in modern sheathed flexible cords 27

H1 Tripping time accuracy 40

FIGURES

C1 Cord set 25

C2 Cord extension set 26

Amd 1 Apr '11 | D1 Measurement of the earth continuity resistance between accessible earthed metal parts and the earth pin of the mains plug 29

D2 Measurement of the earth continuity resistance between the mains plug earth pin and the earthing aperture contacts of an EPOD 29

E1 Leakage current test setup using differential test method for Class II three-phase equipment 32

Amd 1 Apr '11
E2 Leakage current test setup using differential test method for Class II single-phase equipment 32
E3 Measurement of the insulation resistance between live supply conductors and accessible earthed metal parts of typical Class I equipment 33
E4 Measurement of the insulation resistance between live supply conductors and accessible metal parts of a typical Class II equipment 33
E5 Measurement of the insulation resistance of an EPOD 34
F1 Measurement of the insulation resistance between live supply conductors to a portable isolating transformer and accessible earthed parts for Class I isolating transformers or accessible metal parts for Class II isolating transformers 36
F2 Measurement of the insulation resistance between live supply conductors and the portable isolating transformer output (secondary) winding 36
Amd 1 Apr '11
F3 Measurement of the insulation resistance between a portable isolating transformer (secondary) winding and accessible earthed parts for Class I isolating transformers 37
G1 Measurement of the insulation resistance of a power supply 39

REFERENCED DOCUMENTS

Reference is made in this document to the following:

JOINT AUSTRALIAN/NEW ZEALAND STANDARDS

AS/NZS 3000:2007	Electrical installations (known as the Australian/New Zealand wiring rules)
AS/NZS 3001:2008	Electrical installations – Re-locatable premises (including caravans and tents) and their site installations
AS/NZS 3002:2008	Electrical installations – Shows and carnivals
AS/NZS 3003:2003	Electrical installations – Patient treatment areas of hospitals and medical and dental practices and dialysing locations
AS/NZS 3010:2005	Electrical installations – Generating sets
AS/NZS 3012:2003	Electrical installations – Construction and demolition sites
AS/NZS 3019:2007	Electrical installations – Periodic verification
AS/NZS 3190:2009	Approval and test specification – Residual current devices (current-operated earth-leakage devices)
AS/NZS 3551:2004	Technical management programs for medical devices
AS/NZS 4249:1994	Electrical safety practices – Film, video and television sites
AS/NZS 4763 (INT):2006	Safety of portable inverters
AS/NZS 5761:2005	In-service safety inspection and testing – Second-hand electrical equipment prior to sale
AS/NZS 5762:2005	In-service safety inspection and testing – Repaired electrical equipment
AS/NZS ISO 9000:2005	Quality management systems – Series of Standards
AS/NZS ISO 31000:2009	Risk management
AS/NZS 60335.1:2002	Household and similar electrical appliances – General requirements
AS/NZS 61008.1:2004	Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs) – General rules
AS/NZS 61009.1:2004	Residual current operated circuit-breakers with integral overcurrent protection for household and similar uses (RCBOs) – General rules

AUSTRALIAN STANDARDS

AS 1674.2:2007	Safety in welding and allied processes – Electrical
AS 2790:1989	Electricity generating sets – Transportable (Up to 25 kW)
AS 60529:2004	Degrees of protection provided by enclosures (IP Code)

NEW ZEALAND STANDARD

NZS 6115:2006	Electrical Installations – Mobile electro-medical connectable installations

INTERNATIONAL STANDARDS

IEC 60320:– (All parts)	Appliance couplers for household and similar general purposes

NEW ZEALAND LEGISLATION

Electricity Safety Regulations 2010

FOREWORD

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL 036 – In-service testing of electrical equipment to supersede AS/NZS 3760:2003 and its Amendment No. 1 (2005) from the date of publication. This edition has undergone a complete revision.

In-service testing is a necessary part of any safety program to help ensure the safety of persons using electrical equipment in the workplace. This Standard specifies in-service safety inspection and testing protocols and criteria that satisfy these obligations, and provides a cost-effective approach to safety without jeopardizing personnel safety or involving excessive equipment downtime.

The philosophy of the document is to provide an inspection and testing regime capable of implementation with only simple instrumentation, and performed by a person not necessarily having formal qualifications or registration, but who has the necessary practical and theoretical skills, acquired through training, qualification, experience or a combination of these, to correctly undertake the tasks prescribed by this Standard.

Amd 2
Dec '12

This Standard is not intended to demonstrate that equipment complies with the safety Standard appropriate to the equipment.

The methodology of the inspection and testing process is defined.

The frequency of repetition of that process is determined by the equipment type and by examination of the environment in which the equipment is used or working. For indicative purposes a number of different environments are provided with associated or suggested inspection/testing frequencies. These are based on the perception of the level of hazard and the degree of abuse to which the equipment is typically exposed. However, there will usually be multiple sub-environments within any location and the inspecting/testing frequency will be arrived at by an assessment of the actual environment in which the equipment is placed or used.

Words in **bold** in the text are defined in 1.4. When a definition concerns an adjective, the adjective and associated noun are also in **bold**.

OUTCOME STATEMENT

AS/NZS 3760 will enable persons responsible for the safety of electrical equipment in the workplace to instigate an inspection and testing programme to achieve that aim. It also enables persons undertaking the inspection and testing to carry out the task in a safe and effective manner.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard
In-service safety inspection and testing of electrical equipment

SECTION 1 – SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies procedures for the safety inspection and testing of **low voltage** single phase and polyphase electrical equipment, connected to the electrical supply by a flexible cord or connecting device, and that

(a) Is new equipment placed into service for the first time;

(b) Is already in-service;

(c) Has been serviced or repaired;

(d) Is returning to service from a second-hand sale; or

(e) Is available for **hire**.

This Standard also specifies procedures for the safety inspection and testing of

(f) **Residual current devices (RCDs)** except those within the scope of AS/NZS 3003 and NZS 6115; and

(g) Portable inverters that generate or produce **low voltage**.

Typical examples of equipment covered by this Standard are:

(h) **Portable equipment**, hand-held equipment and **stationary equipment**, designed for connection to the **low voltage** supply by a **supply cord**, an appliance inlet or pins for insertion into a socket-outlet (see Figure G1);

(i) **Cord sets, cord extension sets** and outlet devices (also known as **electrical portable outlet devices (EPODs)**, or power boards);

(j) Flexible cords connected to **fixed equipment** in **hostile environments**;

(k) Portable power supplies (includes power adaptor/plug-pack, both of the safety **isolating transformer** and switch-mode type);

(l) Battery chargers including those for commercial or industrial use;

(m) Portable and transportable heavy duty tools such as high pressure washers and concrete grinders.

1.1.1

This Standard applies only to equipment in-service at a place of work or public place, or offered for **hire**.

1.1.2

This Standard does not apply to electrical equipment (such as suspended light fittings), installed at a height of 2.5 m or greater above the ground, floor or platform, where there is not a reasonable chance of a person touching the equipment and, at the same time, coming into contact with earth or any conducting medium which may be in electrical contact with earth or through which a circuit may be completed to earth.