

*Dup*  
*Under Revision DR 93018*  
*Superseded by AS/NZS 3760:1996*

AS 3760—1990

Australian Standard®

---

**In-service safety inspection and  
testing of electrical equipment**

---

*D 1*



This Australian Standard was prepared by Committee EL/36, In-Service Testing of Electrical Equipment. It was approved on behalf of the Council of Standards Australia on 13 December 1989 and published on 7 May 1990.

---

The following interests are represented on Committee EL/36:

Air Conditioning Council of Australia  
Australian Electrical and Electronic Manufacturers Association  
Building Industry Specialist Contractors Organization of Australia  
Confederation of Australian Industry  
Department of Industrial Relations and Employment NSW  
Electrical Contractors Associations of Australia  
Electrical Trades Union of Australia  
Public Works Department NSW  
Regulatory Authorities (Electrical)  
Telecom Australia

---

**Review of Australian Standards.** To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up-to-date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

---

This Standard was issued in draft form for comment as DR 88050.

Dup

STANDARDS AUSTRALIA



---

Amendment No 1  
to  
AS 3760—1990

**In-service safety inspection and testing of electrical equipment**

---

**REVISED TEXT**

The 1990 edition of AS 3760 is amended as follows; the amendment should be inserted in the appropriate place.

**SUMMARY:** This Amendment applies to Clause 2.4.7.

Published on 15 April 1991.

AMDT  
No 1  
APR.  
1991

---

---

**Page 8. Clause 2.4.7**

In the 2nd paragraph, *delete* existing 100 ms requirement in Item (b) and *insert* 300 ms.

This amendment forms part of the Specification on publication.

---

AS 3760—1990

**Australian Standard®**

---

**In-service safety inspection and  
testing of electrical equipment**

---

First published as AS 3760—1990.

PUBLISHED BY STANDARDS AUSTRALIA  
(STANDARDS ASSOCIATION OF AUSTRALIA)  
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY NSW

ISBN 0 7262 6092 4

## PREFACE

This Standard was prepared by the Standards Australia Committee on in-service testing of electrical equipment, in response to requests for guidance to employers, owners and users of equipment who all need to conduct in-service testing for equipment safety.

Such in-service testing is necessary for the safety of persons using the equipment and for the proper discharge of the obligations of employers and employees, as listed in the State legislations covering occupational health and safety matters. This Standard specifies in-service safety inspection and testing protocols and criteria that satisfy these obligations and provides an approach to safety which is cost effective without jeopardizing personnel safety or involving excessive equipment downtime.

During preparation of this first edition of this Standard, the Committee was aware—

- (i) of the urgent need for uniform inspection and testing requirements that could be adopted on a national basis by Australian industries and authorities;
- (ii) that specification of relatively simple inspection and testing requirements that could be conducted, at reasonable intervals, by appropriately trained personnel using readily available testing equipment would be certain to gain wider acceptance and lead to very much improved and cost effective safety practices; and
- (iii) that opportunity could be taken to amend, quickly, the requirements (i.e. reduce or extend) in light of experience gained during application of this first edition.

The in-service safety inspection and testing requirements in this Standard do not cover testing for design and approval of equipment (which is covered separately in the AS 3100 and AS 3300 series of Standards) or the comprehensive testing to be conducted by specialized repair personnel, e.g. licenced repair agents, (which is intended to be included in a separate standard currently under development).

For the reasons outlined above, this edition of this Standard has incorporated only the minimum of electrical tests and has placed considerable emphasis on regular and comprehensive visual inspections. However, depending on experience with the application of the Standard, consideration will be given to extending future editions to include more comprehensive electrical tests (e.g. leakage current test, high current earthing conductor tests).

Finally, it should be noted that requirements for repair of faulty equipment and the more comprehensive electrical testing to be conducted, by personnel with specialized training, prior to the return of repaired equipment are not included in this Standard. Requests for development of a new Standard to cover such testing are under consideration.

In the preparation of this Standard, reference was made to material previously published by the State Electricity Commission of Victoria, Department of Industrial Relations and Employment (NSW), Victorian Occupational Health and Safety Commission, and Telecom Australia (Building Engineering Section). Grateful acknowledgement is made of the assistance from those sources.

### © Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the Head Office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

## CONTENTS

	<i>Page</i>
FOREWORD .....	4
SECTION 1. SCOPE AND GENERAL	
1.1 SCOPE .....	5
1.2 APPLICATION .....	5
1.3 DEFINITIONS .....	5
SECTION 2. INSPECTIONS AND TESTS	
2.1 SCOPE OF SECTION .....	6
2.2 FREQUENCY OF INSPECTION AND TESTS .....	6
2.3 PERSONNEL .....	6
2.4 INSPECTION AND TESTING .....	6
APPENDICES	
A TEST OF EARTHING .....	9
B INSULATION RESISTANCE TESTING .....	10
C INSULATION RESISTANCE TESTING OF PORTABLE ISOLATION TRANSFORMERS .....	12
D TEST FOR OPERATION OF PORTABLE RESIDUAL CURRENT DEVICES (RCDs) .....	14
E APPLICATION OF STANDARD BY TELECOM AUSTRALIA .....	15
F ADVISORY AUTHORITIES .....	16

## FOREWORD

The following items are all necessary for the safe use of electrical equipment:

- (a) The equipment needs to be designed and manufactured to appropriate safety standards.
- (b) Each item of equipment needs to be subjected to routine inspection and testing to detect damage, wear, or other conditions which might render it unsafe.
- (c) Equipment identified as faulty needs to be withdrawn from service and referred for repair or disposal by expert personnel.
- (d) Appropriate equipment needs to be used for each particular application.
- (e) In specific cases, e.g. for use in confined spaces, equipment also needs to be used in accordance with an appropriate set of rules linking the type of work with the class of equipment and environmental safety facilities.


As indicated in the Preface, this Standard confines itself to the matters in Item (b), i.e. specifying inspection requirements and non-destructive tests that can be reasonably carried out to monitor the safety of the equipment.


The following basic rationale provides some insight and background to the inspection and electrical testing requirements specified in this Standard.

**PRINCIPLES OF CONSTRUCTION OF ELECTRICAL EQUIPMENT.** Accessible conductive parts of equipment operating from supply voltage must be protected from becoming live in the event of insulation failure or the bypassing of insulation during the normal use of the equipment (e.g. through the ingress of liquids or foreign objects).

This protection may be provided by either one or a combination of the following:

- (a) Provision of single insulation between the accessible conductive parts and the live parts, and earthing the accessible conductive parts.
- (b) Provision of double or reinforced insulation between the accessible conductive parts and the live parts.

Equipment in which some or all the accessible conductive parts require protective earthing, as described in (a), are single insulated items and are also referred to as Class I equipment. The protective earthing terminal of this equipment is marked with either of the symbols 'E' or .

Equipment in which none of the accessible conductive parts require protective earthing, due to the provision of double or reinforced insulation as described in (b), are double insulated items and are also referred to as Class II equipment. This equipment is marked with the symbol  or with the words 'DOUBLE INSULATED'.

**PROTECTIVE EARTHING.** The resistance to earth from protectively earthed parts in Class I equipment must be low enough to permit adequate fault current to flow to earth, thereby ensuring that the overcurrent protection device in the final subcircuit (i.e. fixed wiring) opens quickly in the event of insulation failure.

The protective earthing conductor also ensures that any leakage current from the live parts within Class I equipment flows harmlessly via a low resistance path, to earth.

Accordingly, all Class I equipment must have the integrity and resistance value of its earthing conductor checked at regular intervals during its service life, e.g. to ensure that connections have not been loosened, transposed or corroded.

**INSULATION RESISTANCE.** Insulation resistance testing is intended to ensure the integrity of the insulation between live mains parts and accessible conductive parts.

Accordingly, equipment must have its insulation resistance measured prior to commissioning and at regular intervals during its service life, to ensure that no degradation has occurred since manufacture, during transport, or during its service life.