

Australian/New Zealand Standard™

Explosive atmospheres

**Part 17: Electrical installations
inspection and maintenance
(IEC 60079-17:2012 (ED.5.0) MOD)**



AS/NZS 60079.17:2017

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-014, Equipment for Explosive Atmospheres. It was approved on behalf of the Council of Standards Australia on 16 October 2017 and by the New Zealand Standards Approval Board on 1 November 2017.
This Standard was published on 12 December 2017.

The following are represented on Committee EL-014:

Auckland Regional Chamber of Commerce
Australian Chamber of Commerce and Industry
Australian Industry Group
Australian Institute of Petroleum
Australian Petroleum Production and Exploration Association
Australian Pipelines and Gas Association
Aviation and Marine Engineers Association
Bureau of Steel Manufacturers of Australia
Department of Natural Resources and Mines, Qld.
Department of Trade and Investment, NSW
Electrical Contractors Association of New Zealand
Electrical Regulatory Authorities Council
Electrical Safety New Zealand
Engineers Australia
Independent Expert
Institute of Electrical Inspectors
Institute of Instrumentation, Control and Automation Australia
Institution of Professional Engineers New Zealand
Mining Electrical and Mining Mechanical Engineering Society
Ministry of Business, Innovation and Employment, New Zealand
University of Newcastle
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 Standards may also be withdrawn.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 Australia Web Site 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.

Australian/New Zealand Standard™

Explosive atmospheres

Part 17: Electrical installations inspection and maintenance (IEC 60079-17:2015 (ED.5.0) MOD)

Revised as AS/NZS 60079.17:2009.
Second edition 2017.

COPYRIGHT

© Standards Australia Limited

© The Crown in right of New Zealand, administered by the New Zealand Standards Executive

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

ISBN 978 1 76035 964 5

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-014, Equipment for Explosive Atmospheres, to supersede AS/NZS 60079.17:2009, *Explosive atmospheres, Part 17: Electrical installations inspection and maintenance (IEC 60079-17, Ed. 4.0 (2007) MOD)*.

The objective of this Standard is to set out the requirements for ongoing inspections of electrical installations and maintenance of electrical equipment in explosive atmospheres.

This Standard is an adoption with national modifications; it has been reproduced from IEC 60079-17:2013 (ED.5.0), *Explosive atmospheres, Part 17: Electrical installations inspection and maintenance*, and has been varied as indicated to take account of Australian/New Zealand conditions.

This Standard is structured as follows:

- (a) Preface.
- (b) IEC 60079-17:2013 (ED.5.0) (unedited from the contents page to the final clause of the source document).
- (c) Appendix ZZ—Australian/New Zealand variations to the source document.

The variations listed in Appendix ZZ address issues including the following:

- (i) Identification of relevant AS or AS/NZS Standards as normative references.
- (ii) Reference to competency of personnel rather than qualifications, and deletion of Annex B and in its place reference to AS/NZS 4761.1, *Competence for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards*.
- (iii) Modification of normal inspection periods from 5 years to 4 years for established practice in Australia and New Zealand.
- (iv) Reduction and clarification of some inspection details to meet accepted practice in Australia and New Zealand.
- (v) Addition of inspection detail for 'Ex'v' and type of protection 'p' for rooms to Australian Standards.

As this Standard is reproduced from an International Standard, the following applies:

- (A) In the source text 'this part of the IEC 60079 series' should read 'this Australian/New Zealand Standard'.
- (B) A full point substitutes for a comma when referring to a decimal marker.

Australian or Australian/New Zealand Standards that are identical adoptions of international normative references may be used interchangeably. Refer to the online catalogue for information on specific standards.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex or appendix to which they apply. A 'normative' annex or appendix is an integral part of a standard, whereas an 'informative' annex or appendix is only for information and guidance.

CONTENTS

FOREWORD.....	5
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms and definitions	9
4 General requirements	11
4.1 Documentation.....	11
4.2 Qualification of personnel	11
4.3 Inspections	11
4.3.1 General	11
4.3.2 Grades of inspection.....	12
4.3.3 Types of inspection.....	13
4.4 Periodic inspections	13
4.4.1 Personnel	13
4.4.2 Fixed installations.....	13
4.4.3 Movable equipment.....	14
4.5 Continuous supervision by skilled personnel	14
4.5.1 Concept.....	14
4.5.2 Objectives	14
4.5.3 Responsibilities	15
4.5.4 Frequency of inspection	15
4.5.5 Documents	16
4.5.6 Training	16
4.6 Maintenance requirements.....	16
4.6.1 Remedial measures and alterations to equipment.....	16
4.6.2 Maintenance of flexible cables.....	17
4.6.3 Withdrawal from service.....	17
4.6.4 Fasteners and tools.....	17
4.7 Environmental conditions	17
4.8 Isolation of equipment.....	18
4.8.1 Installations other than intrinsically safe circuits	18
4.8.2 Intrinsically safe installations live maintenance	19
4.9 Earthing and equipotential bonding	20
4.10 Specific conditions of use	20
4.11 Movable equipment and its connections	20
4.12 Inspection schedules (Tables 1 to 3).....	20
4.12.1 General	20
4.12.2 Equipment is appropriate to the EPL/zone requirements of the location.....	20
4.12.3 Equipment group	20
4.12.4 Equipment maximum surface temperature	20
4.12.5 Equipment circuit identification	20
4.12.6 Cable gland	21
4.12.7 Type of cable.....	21
4.12.8 Sealing	21

4.12.9	Fault loop impedance or earthing resistance	21
4.12.10	Insulation resistance	21
4.12.11	Overload protection	21
4.12.12	Lamps and luminaires	21
5	Additional inspection schedule requirements	22
5.1	Type of protection “d” – Flameproof enclosure (see Table 1 and IEC 60079-1)	22
5.2	Type of protection “e” – Increased safety (see Table 1 and IEC 60079-7)	22
5.3	Type of protection “i” – Intrinsic safety (see Table 2 and IEC 60079-11).....	22
5.3.1	General	22
5.3.2	Documentation	22
5.3.3	Labelling.....	23
5.3.4	Unauthorized modifications.....	23
5.3.5	Associated apparatus (safety interface) between intrinsically safe and non-intrinsically safe circuits	23
5.3.6	Cables	23
5.3.7	Cable screens.....	23
5.3.8	Point-to-point connections	23
5.3.9	Earth continuity of non-galvanically isolated circuits	23
5.3.10	Earth connections to maintain the integrity of the intrinsic safety	24
5.3.11	Intrinsically safe circuit earthing and/or insulation	24
5.3.12	Separation between intrinsically safe and non-intrinsically safe circuits	24
5.4	Type of protection “p” and “pD” – Pressurized enclosure (see Table 3, IEC 60079-2 and IEC 61241-4).....	24
5.5	Type of protection “n” (see Table 1 or 2 and IEC 60079-15).....	24
5.5.1	General	24
5.5.2	Restricted breathing enclosures.....	25
5.6	Type of protection “t” and “tD” – Protection by enclosure (see Table 1 and IEC 60079-31 and IEC 61241-1)	25
5.7	Types of protection “m” and “mD” (encapsulation), “o”, (oil-immersion) “op” (optical insulation) and “q” (powder-filling).....	25
6	Inspection tables	25
	Annex A (informative) Typical inspection procedure for periodic inspections	30
	Annex B (normative) Knowledge, skills and competencies of responsible persons, technical persons with executive function and operatives.....	31
B.1	Scope	31
B.2	Knowledge and skills	31
B.2.1	Responsible persons and technical persons with executive function	31
B.2.2	Operative/technician (inspection and maintenance)	31
B.3	Competencies	32
B.3.1	General	32
B.3.2	Responsible persons and technical persons with executive function	32
B.3.3	Operative/technician	32
B.4	Assessment	32
	Annex C (informative) Fitness-for-purpose assessment	33
C.1	Background.....	33

C.2	Need for a fitness-for-purpose assessment	33
C.3	Approach	33
C.4	Ignition sources	33
C.5	Contents of the fitness-for-purpose assessment.....	33
C.5.1	General	33
C.5.2	Scope	33
C.5.3	Equipment and its application	34
C.5.4	Description	34
C.5.5	Function of the product including the location	34
C.5.6	Specification	34
C.5.7	Standards compliance	34
C.5.8	Documents	35
C.5.9	Product sample.....	35
C.5.10	Equipment label.....	35
C.5.11	Training of personnel.....	35
Annex D (informative)	Example of motor checks	36
Bibliography.....		37
Figure A.1	– Typical inspection procedure for periodic inspections.....	30
Table 1	– Inspection schedule for Ex “d”, Ex “e”, Ex “n” and Ex “t/D”	25
Table 2	– Inspection schedule for Ex “i” installations.....	28
Table 3	– Inspection schedule for Ex “p” and “pD” installations	29

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to comply with IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 60079-17 has been prepared by subcommittee 31J: Classification of hazardous areas and installation requirements, of IEC technical committee 31: Equipment for explosive atmospheres.

This fifth edition cancels and replaces the fourth edition published in 2007 and constitutes a technical revision.

The significant technical changes with respect to the previous edition are as follows:

- Equipment specific inspection tables for luminaires, heating systems and motors have been added into Annex A to supplement the general protection concept tables.
- Document has been updated to complement the changes made to IEC 60079-14 for initial inspection.

The text of this standard is based on the following documents:

FDIS	Report on voting
31J/224/FDIS	31J/229/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This International Standard is to be used in conjunction with IEC 60364-6.

A list of all parts of the IEC 60079 series, under the general title *Explosive atmospheres* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

INTRODUCTION

Electrical installations in hazardous areas possess features specially designed to render them suitable for operations in such atmospheres. It is essential for reasons of safety in those areas that, throughout the life of such installations, the integrity of those special features is preserved. This standard provides the details for initial inspection and on-going inspections as either;

- a) regular periodic inspections thereafter, or,
- b) continuous supervision by skilled personnel.

When necessary, maintenance may also be needed.

Correct functional operation of hazardous area installations does not mean, and should not be interpreted as meaning, that the integrity of the special features referred to above is preserved.

Inspections are carried out in accordance with this standard, however for older installations the details for the equipment and installations requirements should be referenced to the standards applied at the date of the installation.

NOTE Standards applied at the date of installation may not have been IEC standards.

AUSTRALIAN/NEW ZEALAND STANDARD

Explosive atmospheres**Part 17: Electrical installations inspection and maintenance
(IEC 60079-17:2013 (ED.5.0), MOD)****1 Scope**

This part of the IEC 60079 series applies to users and covers factors directly related to the inspection and maintenance of electrical installations within hazardous areas only, where the hazard may be caused by flammable gases, vapours, mists, dusts, fibres or flyings.

It does not include:

- other fundamental installation and inspection requirements for electrical installations;
- the verification of electrical equipment;
- the repair and reclamation of explosion protected equipment (see IEC 60079-19).

This standard supplements the requirements of IEC 60364-6.

In the case of dusts, fibres or flyings the level of housekeeping may influence the inspection and maintenance requirements.

This standard is intended to be applied where there can be a risk due to the presence of explosive gas or dust mixtures with air or combustible dust layers under normal atmospheric conditions. It does not apply to:

- underground mining areas,
- dusts of explosives that do not require atmospheric oxygen for combustion,
- pyrophoric substances.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-0, *Explosive atmospheres - Part 0: Equipment - General requirements*

IEC 60079-1, *Explosive atmospheres – Part 1: Equipment protection by flameproof enclosures "d"*

IEC 60079-2, *Explosive atmospheres – Part 2: Equipment protection by pressurized enclosures "p"*

IEC 60079-7, *Explosive atmospheres – Part 7: Equipment protection by increased safety "e"*

IEC 60079-10-1, *Explosive atmospheres – Part 10-1: Classification of areas – Explosive gas atmospheres*

IEC 60079-10-2, *Explosive atmospheres – Part 10-2: Classification of areas – Combustible dust atmospheres*