

Australian/New Zealand Standard™

**Electrical equipment for mines and  
quarries—Explosion-protected three-  
phase restrained plugs and receptacles  
for working voltages up to and including  
3.3 kV**



## **AS/NZS 1299:2009**

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-023, Electrical Equipment in Mines and Quarries. It was approved on behalf of the Council of Standards Australia on 26 November 2009 and on behalf of the Council of Standards New Zealand on 13 November 2009. This Standard was published on 9 December 2009.

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The following are represented on Committee EL-023:

Australian Chamber of Commerce and Industry  
Australian Coal Association  
Australian Industry Group  
Aviation and Marine Engineers Association, New Zealand  
Department of Mines and Energy, Qld  
Department of Mines and Petroleum, WA  
Department of Primary Industries, Mine Safety NSW  
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# Electrical equipment for mines and quarries—Explosion-protected three-phase restrained plugs and receptacles for working voltages up to and including 3.3 kV

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## PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-023, Electrical Equipment in Mines and Quarries, to supersede AS 1299—1993, *Electrical equipment for coal mines—Flameproof restrained plugs and receptacles*.

*This Standard incorporates Amendment No. 1 (March 2012). 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 provide requirements and guidance for explosion-protected three-phase restrained plugs and receptacles to manufacturers, users, regulatory authorities and associated interests and for use with other related Australian/New Zealand Standards and relevant mining regulations. It also is to allow for the use of existing compatible cable coupling systems and for the introduction of new non-compatible cable coupling systems.

This Standard differs from the previous edition in the following significant ways:

- (a) Recognizes the AS/NZS 60079 series of Standards.
- (b) Introduces provisions for alternative designs. Plugs and receptacles that are dimensionally compatible with this Standard are called Type A. Alternative designs are called Type B.
- (c) Updated figures showing critical compatibility dimensions and flamepaths ensure compatibility between different makes of Type A components.
- (d) Provides for transition devices between Type A and Type B components.
- (e) Increased emphasis on integrity of earth paths.
- (f) Clarifies test criteria.
- (g) Allows for higher current ratings.
- (h) Defines maximum voltage for restrained systems at 3.3 kV.
- (i) Removes reference to coal mines and includes mines and quarries.
- (j) Withdrawal of AS 1147.1, *Electrical equipment for coal mines—Insulating materials, Part 1: Materials for insulating power conducting components* and incorporation of test requirements into Appendix B of this Standard. Materials tested by authorities to Standards listed in Appendix B may be accepted without verification.
- (k) Outlines additional marking requirements in Clause 1.6.
- (l) Illustrates the quick-release concept in Figure 1.1.
- (m) Introduces the term ‘explosion-protected’ throughout the Standard.
- (n) Allows for non-metallic materials to be used in the construction of the components (refer to Clause 2.3).
- (o) Details requirements of earthing through the plugs and receptacles.
- (p) Allows for pins and socket earths in Type B designs (as opposed to scraping earth in Type A).
- (q) Defines the plug removal sequence (refer to Clause 2.11.2).
- (r) Increases earth size in cable reel receptacles from 6 mm<sup>2</sup> to 16 mm<sup>2</sup>.
- (s) Increases phase barrier earth connection to at least 6 mm<sup>2</sup>.

- (t) Provides template drawings to allow manufacturers of explosion-protected enclosures to design outlets that do not compromise the integrity of receptacles.
- (u) Establishes a test to ensure integrity of scraping earth contacts.
- (v) Adds Section 4 with figures and dimensions.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this standard.

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## SECTION 1 SCOPE AND GENERAL

**1.1 SCOPE**

This Standard specifies the design and test requirements for explosion-protected three-phase restrained plugs and receptacles incorporating three power contacts, one pilot contact and possibly one or more auxiliary contacts, an earth contact and an earthed phase barrier intended for use with restricted earth-fault systems in mines and quarries with a working voltage up to and including 3.3 kV. Provision is also made for restrained back-to-back receptacles, which enable lengths of cable to be coupled together.

Restrained plugs and receptacles constructed to this Standard are not intended to be coupled or uncoupled while the circuit is energized.

The Standard covers two types of restrained plugs and receptacles:

**(a) Type A**

Designed according to Figures in this Standard that prescribe the dimensions necessary to interconnect plugs or receptacles from different manufacturers.

**(b) Type B**

Designed to dimensions that are not compatible with Type A plugs or receptacles. Type B plugs or receptacles cannot be plugged into or accept a Type A plug or receptacle under normal operation.

Type B plugs and receptacles do not comply with Figures 4.1 to 4.16 but comply with all other requirements of this Standard. Where there is a variation to a particular clause for Type B plugs and receptacles it is specifically stated. The use of transition devices between Type A and Type B systems is permitted.

This Standard also deals with some electrical and mechanical requirements, including the provision of earthed phase barriers to protect against interphase faults. It does not specify fully detailed designs.

This Standard provides for plug and receptacle discrimination, i.e. an arrangement whereby plugs and receptacles of different rated voltages or currents are physically prevented from being engaged.

The requirements of AS/NZS 1747 should be considered in the design of these devices.

## NOTES:

- 1 The term 'receptacle' as used in this Standard is synonymous with the term 'socket-outlet' in AS/NZS 3000. The term 'receptacle' has been chosen to avoid confusion with the individual sockets within the plug.
- 2 Appendix A lists the information that a user should provide with any enquiry or order.
- 3 Appendix C lists the information which should be supplied by the designer or manufacturer.
- 4 A typical plug and receptacle (quick-release) assembly is shown in Figure 1.1 and a typical restrained back-to-back receptacle is shown in Figure 1.2.