

## Australian Standard

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# **TERMINALS FOR SWITCHGEAR ASSEMBLIES FOR ALTERNATING VOLTAGES ABOVE 1 kV**

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[Title Allocated by Defence Cataloging Authority—Terminal,  
Lug (for switchgear assemblies with a.c. voltage above 1 kV)]

The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian-British Trade Association  
Australian Electrical and Electronics Manufacturers Association  
Confederation of Australian Industry  
Electricity Supply Association of Australia  
Institution of Engineers, Australia  
Railways of Australia Committee  
Testing Authorities

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This standard, prepared by Committee EL/7, Power Switchgear, was approved on behalf of the Council of the Standards Association of Australia on 6 August 1980, and was published on 1 November 1980.

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## PREFACE

This standard was prepared by the Association's Committee on Power Switchgear.

The standard covers the requirements for terminals for indoor and outdoor switchgear assemblies and ancillary equipment for alternating voltages above 1 kV such as are employed in connection with the generation, transmission, distribution and utilization of electric power. It specifies dimensions and current ratings for terminals, and deals with the basis for the design of terminals and recommendations for joint design in appendices.

In the preparation of the standard consideration was given to IEC Report 518, Dimensional Standardization of Terminals for High-voltage Switchgear and Controlgear, and an ESAA document on the standardization of equipment palm terminals, and acknowledgement is made of the assistance received therefrom.

IEC 518 gives dimensions of terminals of cylindrical shape and the IEC sizes have been adopted herein. For terminals of rectangular shape, IEC 518 gives only the diameters of and distances between holes. These dimensions have been retained herein, except for terminal number 12 where the 60 mm spacing does not accommodate the conductor terminal; in this case a spacing of 70 mm has been used. Additionally an alternative hole diameter of 18 mm has been included for terminal numbers 7 to 12 for the reason given in Appendix A.

This standard may require reference to the following documents:

AS 1025	High-voltage Switches
AS 1033	High-voltage Expulsion and Similar Fuses

AS 1034	High-voltage Current-limiting Fuses
AS 1100	Drawing Practice Part 11—Indication of Surface Texture
AS 1110	ISO Metric Hexagon Precision Bolts and Screws
AS 1111	ISO Metric Hexagon Commercial Bolts and Screws
AS 1237	Flat Metal Washers for General Engineering Purposes (Metric Series)
AS 1306	High Voltage Isolators (Disconnectors) and Earthing Switches
AS 1444	Wrought Alloy Steels—AISI-SAE H and Standard Steels Types
AS 1865	Wrought Aluminium and Aluminium Alloy Drawn Wire, Rod, Bar and Strip for General Engineering Purposes
AS 1968	Helical Spring Lock Washers (Metric Series)
AS 2006	High Voltage Alternating Current Circuit-breakers
AS 2067	Switchgear Assemblies and Ancillary Equipment for A.C. Voltages Above 1 kV
AS 2338	Preferred Dimensions of Wrought Metal Products
AS 3000	SAA Wiring Rules
SAA MP19	Report on Preferred Numbers and Their Use

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## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

## for

**TERMINALS FOR SWITCHGEAR ASSEMBLIES FOR ALTERNATING  
VOLTAGES ABOVE 1 kV**

**1 SCOPE.** This standard specifies dimensions and configuration for terminals intended for use on indoor and outdoor switchgear assemblies for alternating voltages above 1 kV such as are employed in connection with the generation, transmission and distribution of electric power. It also applies to the ancillary equipment used in conjunction with the switchgear.

**2 APPLICATION.** This standard applies to terminals on electrical equipment and on ancillary connections such as busbars. It does not apply to terminals internal to switchgear, switchboards and similar, where the connection may be an integral part of the design.

This standard does not require all connections on to terminals to be made with fasteners. Other methods may be more appropriate and reference should be made to AS 2067, Appendix C, for a description of these.

NOTE: The intention of the standard is that of establishing a set of dimensions of terminations for equipment for ease of assembly and interchangeability. In this context, it is appreciated that equipment to which the terminals are applicable will have a current rating in accordance with the particular standard to which it is tested. Service experience has indicated that despite the various metals and their alloys used in equipment terminals, it is practicable to assign nominal current ratings to terminals of various sizes and coordinate a terminal to an item of equipment having the same current rating.

**3 DIMENSIONAL REQUIREMENTS.**

**3.1 General.** Terminals shall comply with the details and dimensions shown in Figs 1 to 3 and Tables 1 and 2 as appropriate, and with the requirements given in Clauses 3.2 to 3.4.

**3.2 Surface Areas of Terminals.** The current-carrying surface(s) of terminals shall be flat or cylindrical as applicable, free from blemishes and with a surface roughness as defined in AS 1100, Part 11 not greater than 3.2  $\mu\text{m}$ .

The contact and rear surface areas of palm terminals shall be parallel. If the rear surface is required as a current-carrying surface, this shall be specified by the purchaser.

**3.3 Thickness of Palm Terminals.** The palm terminal thicknesses given in Table 1 are considered

to be minimum practical values for the current ratings nominated and for normal mechanical loading. Where special conditions apply, such as abnormal mechanical loading, the thickness shall be as specified by the purchaser, or where applicable shall be subject to his approval.

**3.4 Space Orientation of Major and Minor Axes of Palm Terminals.** The space orientation of the major and minor axes of equipment palm terminals shall be as specified by the purchaser.

**4 CURRENT RATINGS.** The current ratings assigned to the terminals in Figs 1 to 3 are those specified in the various Australian standards for electrical equipment, are in accordance with the R10 series of preferred numbers in SAA MP19, and reflect common usage.

The assigned values for palm terminals may be exceeded provided that the current density at the joint face, i.e. 0.17 A/mm<sup>2</sup> for aluminium or 0.32 A/mm<sup>2</sup> for copper, is not exceeded and that the joint is designed and prepared in accordance with Appendix B.

NOTE: Palm terminals having current ratings exceeding 5000 A and cylindrical terminals having current ratings exceeding 3150 A are not covered by this standard and are a matter for agreement between purchaser and manufacturer.

**5 MATERIAL.** The terminal may be made from any material acceptable to the purchaser.

**6 TERMINAL APPLICATION.**

**6.1 Palm Terminals** (See Figs 1 and 2). All palm terminals except numbers 6 and 11 may be used either as equipment palm terminals or as conductor palm terminals. Terminal number 7 is intended for use as conductor palm terminal with equipment palm terminal number 12.

Terminal numbers 6 and 11 are intended for use as conductor palm terminals.

**6.2 Cylindrical Terminals** (See Fig. 3). Where terminal numbers 13 to 17 are supplied on equipment, suitable adaptor palm terminals shall be provided by the equipment manufacturer if specified by the purchaser.

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